The Search for Scholarly Teaching in Elementary Education

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I dedicate this thesis to my children. Thank you for being so sweet, loud and present. I love you.

ABSTRACT

Elementary teachers are expected to prepare students to work efficiently with others, solve complex problems and self-regulate their own learning. Considering the importance of a solid educational foundation in the early years, students would benefit if elementary teachers engaged in scholarly teaching. The purpose of this study was to investigate Boyer's (1990) four dimensions of scholarship, application, integration, teaching and discovery, to better understand if there is scholarly teaching in elementary education. Four professional teaching documents were analyzed using a hermeneutic orientation. A deductive analysis suggests that we do have scholarly teaching in elementary education, with strong evidence that elementary teachers are scholars of application and integration. An inductive analysis of latent and manifest content suggests that underlying humanistic values run deeply through elementary education driving current curricular, instructional and pedagogical practices.

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CHAPTER 1: INTRODUCTION

Excellent teaching directly influences positive learning experiences (Hartley, 2006; Kirk, Macdonald & O'Sullivan, 2006; Stuntz & Wiess, 2010), thus, we can assume that the more excellent our elementary teachers are, the more capable they will be of providing positive education experiences and lifelong learning. This statement begs the question of how effective elementary education teachers are at providing positive experiences to students. In looking at higher education, Kreber (2002) differentiates between excellent teaching, expert teaching and scholarly teaching, while Trigwell, Martin, Benjamin and Prosser (2000) provide insight about how teachers develop their teaching practice. Kreber (2002) also relates teaching excellence, expertise and scholarly teaching to higher learning theories suggesting that scholarly teaching is more inclusive with higher learning. Trigwell et al. (2000) provides a model for understanding how teachers develop practices that are more inclusive of scholarly teaching. Both indicate that excellence precedes expertise which precedes scholarship, which is suggestive of a teaching continuum. Research in higher education suggests that scholarly teaching has the potential to impact teaching practices on a larger scale and has proven to enhance students' higher learning (Kreber & Cranton, 2000; Morehead & Shedd, 1996). If scholarly teaching surpasses teaching excellence and expertise, should elementary educators strive to adopt scholarly teaching practices or is the concept reserved for higher education?

Kreber (2002) asserts that the vehicle for scholarly teaching is higher learning. Higher learning theory (See Mezirow, 1991; Entwistle, 2002; Freire, 1996/1968),

explains the dynamic process of adult learning and how teachers, as adult learners, evolve along a teaching continuum. Higher learning is supported by activities within Boyer's (1990) four dimensions of scholarship; thus teaching ought to also be reflective of higher learning. According to Boyer (1990), scholars acquire knowledge through research, experience, communication, dialogue and reflection on those experiences. Further, the scholar applies and integrates the knowledge where it will be the most impactful, and disseminates the knowledge in order to push the discipline forward for others to utilize.

Statement of Problem

The role of the teacher is much more demanding than it once was, and teachers are now expected to prepare students to work efficiently with others, solve complex problems and self-regulate their own learning (Eby, Herrell & Jordan, 2006). The basic purpose of teaching is to assist students in learning more efficiently than they would on their own (Angelo, 1996). However, research in educational and developmental psychology has given us a greater awareness about learning and consequently, has influenced our teaching practices. In a typical elementary classroom a teacher is expected to guide the learning of 20-30 students simultaneously. A teacher is also expected to be aware of each student's developmental level, prior knowledge, learning style and interests while keeping the entire class on task, interested, and engaged in order to avoid potential management issues (Jensen, 2009; Tileston, 2000). This is nothing new; this is what many excellent teachers do on a daily basis.

The problem however, is that elementary teaching is never static and teachers are often shuffled to different grades, different disciplines and even different schools. These

three aspects of elementary teaching are significant in determining what knowledge and practices are to be utilized given the specific context. In order for elementary teachers to consistently ensure a solid foundation for each student they must themselves accumulate new knowledge that adheres to the changes they are facing. Each new grade means new instructional, curricular and pedagogical knowledge. With little information about where this new knowledge is gained or if it is sufficient, can we expect our elementary educators to fulfill their role of providing the learning experience that will equip students with the knowledge and skills to solve the worlds future problems?

Purpose of the Study

The purpose of this study was to investigate Boyer's (1990) four dimensions of scholarship in relation to elementary teaching as a distinct discipline, and in relation to elementary teachers as scholars. The questions that will guide this study are:

1. What sources have informed elementary teachers' classroom practices with respect to curriculum, instruction and pedagogy?
2. How have elementary teachers gained knowledge of instruction, curriculum and pedagogy?
3. How have elementary teachers contributed to the production and teaching of knowledge with respect to curriculum, instruction and pedagogy?
4. What teaching practices are enacted by elementary teachers?
5. Do we have scholarly teaching in elementary education?

As an elementary teacher interested in enhancing my own teaching practice, I began searching for examples of scholarly teaching in elementary education. However I found that the concept itself appeared to be reserved for higher education. Higher education teachers who adopt teaching practices that are inclusive with Boyer's (1990) concept of scholarly teaching have greater student learning outcomes (Kreber & Cranton, 2000; Kreber, 2002). Given the importance of a solid educational foundation, elementary teachers would also benefit from being scholarly teachers.

Conceptual Framework

The conceptual framework utilized in this investigation is adopted using research from Boyer's (1990) concept of scholarship in higher learning for application to elementary teaching. The framework is also supported by Kreber's (2002) conceptions of excellence, expertise and scholarly teaching, Trigwell et al.'s (2000) model for understanding development of scholarly teaching, and Freire, (1996/1968) Entwistle and Smith (2002), and Mezirow's (1991) theories of higher learning. Furthermore, Kreber and Cranton (2000) indicate that teaching practice includes activities that encompass curriculum, instruction and pedagogy.

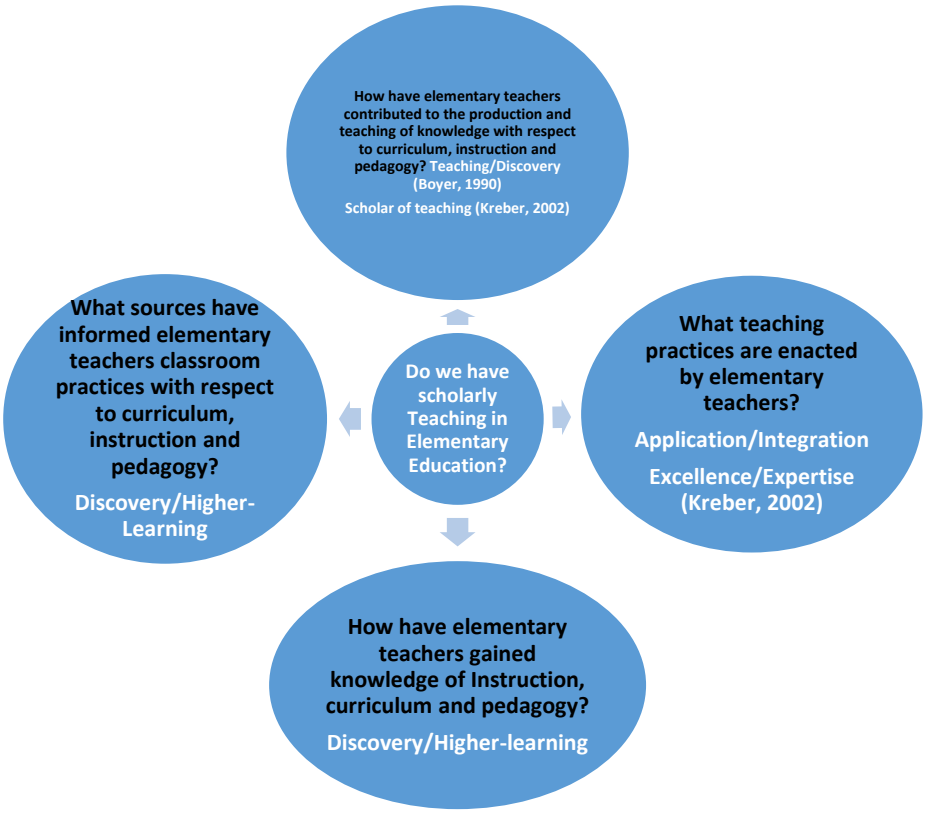

Figure 1. Conceptual Framework. Boyer's (1990) four forms of scholarship are the driving force behind the questions guiding the investigation. The answers to the outer questions will answer the inner question. Do we have scholarly teaching in elementary education?

Scholarly Teaching: Discovery, Integration, Application and Teaching

The traditional understanding of scholarly activity is research and publication (Boyer, 1990). However, Boyer (1990) suggests that scholarship is more than merely research and publication. He asserts that scholarly activity includes the integration and connection of new knowledge with prior knowledge within and across disciplines, the utilization and application of the knowledge and the teaching of the knowledge (Boyer, 1990). Thus, the teacher is also the learner.

Specifically, the teacher who engages in scholarly teaching is also the researcher (Boyer, 1990). Scholarly teaching involves careful observation of the teaching process,

feedback on what and how well students have learned, and evaluating instruction (Boyer, 1990). The research on teaching results in the discovery of new knowledge about the discipline, about teaching and learning and about pedagogy, curriculum and instruction (Kreber & Cranton, 2000). However, for the new knowledge to be of use it must then be applied, integrated and taught.

Boyer (1990) suggests that scholarship should be considered for the purpose of enhancing human knowledge for the betterment of humanity. He asserts that the problems facing society can be tackled through knowledge, research and service; all of which inform each other. As Schön (1986) asserts, teaching in itself is a form of research and ultimately leads to new knowledge. Teaching, as a service, demands that the teacher is knowledgeable about how to best serve the students, parents, school and community, given the context (income level, resources available, and collective or individual behaviours of students, staff and greater learning community), in order to provide opportunities for successful learning and development. In this respect, Boyer (1990) suggests that scholarship be reconsidered to extend beyond research and publication to four dimensions of scholarship: the scholarship of *discovery*, *integration*, *application* and *teaching*.

Developing Scholarly Teaching

In extending on Boyer's (1990) concept of scholarship, Trigwell et al. (2000) offers a model that describes four dimensions that are inclusive of developing scholarship. The four ways include the *information dimension*, the *reflection dimension*, the *communication dimension* and the *conception dimension*. In the information

dimension of teaching, teachers may gain knowledge solely from practice and experience, may gain knowledge through reading of the professional literature, or may conduct research. In the reflection dimension the teacher may may reflect in action to adopt practices as issues arise, or may engage in specific and focused reflection on action. The communication dimension refers to how teachers communicate their knowledge gained about teaching and learning. For instance, teachers may develop knowledge of excellent teaching practices through classroom experience and choose to keep it private, while others may bring their learning to other teacher colleagues within a school or board, present at conferences, or publish in magazines. The conception dimension refers to how teachers conceive teaching; on one end of the continuum teachers are concerned with how to execute an activity, what teacher activities to plan, how well the teacher is following the lesson plan. While on the other end of the continuum, the teacher is mainly concerned with the student experiences (Trigwell, et al., 2000).

Trigwell et al.'s (2000) model provides a framework for recognizing scholarship in teaching. For example, when teachers gain knowledge within the confines of the classroom, and only use the knowledge within the confines of the classroom, there is little opportunity for higher learning about teaching to evolve. As well, if the teacher develops valuable knowledge but does not share the knowledge with the rest of the learning community, the rest of the learning community is also missing out on what may be valuable and useful to the world. Freire (1996/1992) asserts that for liberation man must act and reflect upon their world in order to transform it. Friere's (1996/1992) concept of liberation is the premise that underlies the very concept of scholarship, as Boyer (1990)

asserts that "scholars must think of the usefulness of knowledge" and how it relates to the "world beyond school" (p. 69).

Teaching Continuum: Excellence, Expertise and Scholarly Teaching

The teaching continuum is a reflection of adult learning and involves teaching, excellent teaching, expert teaching and scholarly teaching. According to Angelo (1996), "… teaching is to help students learn more effectively and efficiently than they would on their own" (p. 57). In this regard, and for the purpose of this paper, teaching, is essentially that; assisting students in learning more efficiently than they would on their own, or at least attempting to. Teaching, even at the most basic level, is complex and is a reflection of the teacher-student relation (Boyer, 1990). Moreover, teachers at any level must have some knowledge of curriculum, instruction and pedagogy.

Excellent Teachers

Excellent teachers have an exceptional ability to motivate students, communicate concepts and help students overcome difficulty in their learning (Kreber, 2002). Moreover, excellent teaching has been attributed to the development of a personal teaching philosophy as it provides direction and a premise to all of our endeavours (Skelton, 2009). Oftentimes, teaching excellence is identified through quality of student learning and judgments made by peers, faculty or students (Kreber, 2002). Kreber (2002) suggests that knowledge about teaching is derived in four ways, *formal research, collaborative inquiry, literature,* as well as *practice and experience*. In this sense, excellent teachers may often get their knowledge from experimentation and reflection

alone, which is indicative of knowledge gained through practice and experience. This type of learning demonstrates Habermas' (as cited in Mezirow and Associates, 2000) *instrumental* and *communicative learning*, as the teacher learns the technicality of teaching, such as how to anticipate, be proactive, and communicate effectively to the individuals in the class. Furthermore, this type of learning is a consequence of *reflection in action* and *reflection on action* (Kreber, 2002). Schön (1986) describes reflection on action as an 'after the fact' reflection, when a teacher may reflect on what had happened and how they dealt with what had happened. Reflection in action is when a teacher may stop and think in the midst of the action in an attempt to handle the situation in the most appropriate way, which is a similar concept to Kreber and Cranton's (2000) process reflection. Kreber (2002) makes one thing clear, a teacher may be an excellent teacher, and in this respect, also very effective, however, teaching expertise moves beyond excellence.

Expert Teachers

Expert teachers are excellent teachers; what differentiates the two levels however, is skillful self-regulated learning that informs teaching practice. Teachers who self-regulate learning develop expertise and rarely rely on a repertoire of strategies, or routines. Expert teachers demonstrate transformational theory's fifth mode of making meaning, tapping into and being aware of one's tacit knowledge, which Bell (1997) describes as "a strong intuitive grasp of the living, learning environment. Experts use an intuition that has been sharpened by years of experience in making decisions, rather than using a logical, analytic, and deliberate decision-making process…" (p. 34). This tacit

knowledge can be considered what Schön (1986), describes as knowing in action. Expert teachers consistently build on prior knowledge by consulting literature, conducting research, while connecting and reflecting their learning to their own experiences in action and on action. A desire to be even more effective is what drives the expert (Bell, 1997; Kreber, 2002).

Scholarly Teachers

Finally, scholarly teaching, at the highest level, includes both excellent and expert teaching, but again moves beyond these descriptions. Ernest Boyer (1990) first utilized a more integrated concept of a scholar suggesting that the term scholarship itself should be used in a larger context to "brin[g] legitimacy to the full scope of academic work" (p. 16). Through his research he discovered that the bulk of higher education teachers, although contracted in consequence of research endeavors, had believed in the importance of their instruction, in most cases more than their research (Boyer, 1990). Furthermore, he asserts "that knowledge is acquired through research, through synthesis, through practice, and through teaching" (Boyer, 1990, p. 24). Though teaching that is informed by all four of these avenues is bound to be on the level of expertise, scholarly teaching also consists of a learning community, which includes critique, peer-review, and discourse with other experts in the field. Since scholars consistently share, critique and reflect on knowledge, so too does the scholarly teacher. This is the distinction between the expert and the scholar, the exchange of knowledge. In this sense, scholarly teachers use their theoretical knowledge to assist in their reflective practice and action. As transformative theory informs us, discourse validates and assists in the construction of a more viable or

justifiable truth (Mezirow, 1991; Mezirow and Associates, 2000). Both, Freire (1996/1968) and Mezirow (1991) describe a dialectic pedagogy which creates the highest level of knowledge, so it follows that scholarly teaching allows for the greatest learning outcome. If teaching scholars conduct research, study teaching and learning theory, reflect and connect the theory to their practice, and engage in purposeful, critical discourse with regard to the dimensions of teaching (curriculum, instruction and pedagogy), than their teaching practice will be well informed. Furthermore, the reflection in action as well as the knowledge in action will be more valuable since it will be informed by higher learning, that of transformation. So in this regard, where do our elementary teachers stand on the teaching continuum? Can we consider our elementary teachers excellent, experts or even scholarly?

Elements of Teaching and Learning

According to Kreber and Cranton (2000) elements of teaching and learning include curriculum, instruction and pedagogy. Curriculum is the content that is to be delivered to students and is a reflection of political and social agendas and values (Penny, 2006). Knowledge of instruction involves the strategies used in teaching given the dynamics of the learning environment, while pedagogical knowledge is concerned with knowledge about the cognitive processes that underlie learning (Kreber & Cranton, 2000).

Curriculum

In considering some political factors that have influenced education, in 1997 Ontario went through curriculum reform, and the common curriculum was replaced with the Ontario Curriculum guides (Anderson & Jaafar, 2003). The major difference was that the Common Curriculum emphasized how teachers should teach, and only outlined expectations for grades 3, 6 and 9. The current Ontario curriculum guides outline specific and overall expectations for all grades K-12, emphasizing student achievement over teaching methods. For some, a downside to this may be that teachers are not told exactly how to teach but instead have to figure it out. The upside is that given the dynamic process of the learning environment, there is not a one size fits all method of teaching anyway, so teachers cannot expect that an excellent teaching method is always guaranteed to work for everyone or every classroom.

The curricular content to be delivered to students is a reflection of political and social agendas and values (Penny, 2006). The content for grades one to eight includes: the Arts; French as a second language; Health and Physical Education; Language; Mathematics; Science and Technology; and Social Studies in grades one to six, and History and Geography in grades 7-8 (Ontario Ministry of Education [OME], 2014). To accompany the curriculum, documents and resource guides are available to support teachers' practices.

Instruction

Since the Ontario Curriculum was implemented in 1997, teachers are no longer told how to instruct, but rather the emphasis is placed on learning outcomes. This assumes that teachers are professionals and can be trusted to employ sound decisions in

order to reach the learning outcomes for each individual student. To support and prepare teachers for making sound instructional decisions, the OME has developed resource guides based on evidence, that reflect appropriate instructional options for a variety of subjects, grades, and contexts. The resource guides are developed by professionals in the field who "…examine, synthesize and outline the research to date on teaching…" (OME, 2004). Resources include the Ontario curriculum exemplars of student work; Expert Panel documents that make suggestions based on research with respect to the best methods of instruction for literacy, numeracy, special education and English language learners, and the guides to effective instruction in mathematics K-6, to name a few (OME, 2005; OME, 2006). Instruction varies according to the curricular expectations and to student demographics, but in any case it is to be geared to suit learners' needs.

Although understanding the curriculum goals are necessary in terms of instruction that alone will not always produce high achievement outcomes. Kreber and Cranton (2000) assert that good instructors demonstrate knowledge in how to develop teaching materials, how to facilitate dialogue, know a variety of instructional methods (for example see Mosston & Ashworth, 1990 for information on the spectrum of teaching styles), know how to organize the sequence of instruction, and how to construct and develop authentic learning tasks and assessments. Ultimately, instruction is how the teacher sets up the curricular content for the student population, where pedagogy, the third dimension of teaching, is contextual to the learner, curriculum and instruction.

Pedagogy

Pedagogical knowledge reflects how teachers respond to the context of learning situations, and involves being able to motivate students according to learning styles, and interests, being able to facilitate critical thinking and collaboration among students, and being aware of specific techniques that work in relation to the content being taught (Kreber & Cranton, 2000). To be effective, the teacher must "…understand that something is so…and must understand why it is so…" (Shulman, 2004, p. 202). Shulman (2004) refers to a specific type of knowledge he termed 'pedagogical content knowledge', that often takes the form of analogies, illustrations, examples, or demonstrations with regard to a given topic, concept or idea. Teachers then must have available a variety of insights into how to represent a topic, concept, or idea, in order to cater to a variety of learning styles, needs and interests so that the content taught becomes meaningful, as Entwistle and Smith (2002) suggests this is crucial to new learning. Pedagogical content knowledge can be developed through research and through the "wisdom of practice" (Shulman, 2004, p. 203). Naturally, as teachers gain more experience in the field they demonstrate professional growth which includes changes in their teaching behaviours, knowledge, beliefs and perceptions (Behets & Vergauwen, 2006; Kreber, 2000). Through scholarly activities, teachers can further, their knowledge, understanding and teaching practice.

CHAPTER 2: LITERATURE REVIEW

Introduction

Scholarship is the activity involved in knowledge discovery and utilization for the betterment of humanity (Boyer, 1990). Therefore, for the purpose of advancing our human civilization, scholarship should be the goal for all learning institutions including elementary education. One need only navigate the Ontario Ministry of Education website or latest policy and program document to learn of the present societal conditions that are straining the elementary education system and educators. Our elementary education system emphasizes intellectual growth and development however, does this knowing that many other barriers will need to be broken down before intellectual growth and development can take place (Ontario Schools, 2011). On top of educating our future generations in reading, writing, math, logic and so forth, teachers must foster physical, emotional, and social development, while reinforcing positive life skills. To this regard, scholarship may be the key. Boyer (1990) suggests that it is, and asserts that in utilizing scholarship, schools can be of greater service to the nation and the world. Our elementary students are our future leaders, and if they are to resolve the global economic, social, and ecological problems and lead us into a prosperous future, we must ensure our future generations are engaged in learning, and have an ethic of critical inquiry and self-agency, all of which are attributes of higher learning developed through scholarly teaching practices (Friere, 1996/1968).

Elementary Education: The Education Act

Currently, Canada's publicly funded elementary education is governed by the Education Act, which states the duties and responsibilities of Canada`s Ministries of Education and the School Boards. The Education Act also defines the purpose, which is to provide a strong education system that encourages students who recognize and reach their full potential in order to contribute to a ¨…prosperous, caring and civil society (Service Ontario, 01(1), 2012). It further defines the purpose of education, which is to develop highly skilled, knowledgeable, caring citizens who contribute to society. To ensure that all children have an opportunity to benefit from publicly funded education all individuals aged six to 16 are required to attend school or complete a ministry approved education program.

Ontario Ministry of Education

The Ontario Ministry of Education (OME) makes up the governing body for Ontario's publicly funded education and has eight major divisions within it that oversee its functioning. The divisions are: corporate management and services, elementary/secondary business and finance, French language, aboriginal learning and research, instruction and leadership development, learning and curriculum, student achievement and early learning (OME, 2012). This governing body is responsible for the decisions that impact Ontario`s Education system such as designing the curriculum to be taught, allocating money to the school boards, establishing criteria for diplomas and certificates and producing a list of accepted text books and resources to be utilized in

schools. Recognizing the consequence of social inequity across Ontario, the OME's strategic direction emphasizes improving student achievement, reducing gaps in student achievement, and increase the public's confidence in the system (Realizing the promise, 2012, p. 5). In order to reach these goals OME has established policies, programs and requirements that elementary schools must adhere to. Provincial wide measures of student achievement and ongoing research and evaluation initiatives support OME's strategic direction. For example, Ontario's Education and Accountability Office (EQAO), measures student achievement across Ontario for grades 3 and 6, in mathematics, reading and writing, in accordance with the Ontario Curriculum guides. Also, Ontario's Ministry of Education Research and Evaluation Strategy is dedicated to utilizing research and evaluation to improve policies, programs and practices that align with its strategic direction to improve student achievement.

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School boards

The School Boards oversee the functioning of schools in accordance with the regulations of the OME. The boards are responsible for providing the facilities, transportation, and programs, and most boards also take responsibility for hiring teachers and staff. In Ontario there are 72 district school boards and four sectors, English - Public, English - Roman Catholic, French-Public and French-Roman Catholic (OME, 2014). Of these 72 district school boards, one must only navigate a few school board websites to note the substantial differences in values, missions, and strategic directions. The reason for this variation is that each board must cater to the unique school communities within each district; in other words, there is not a one size fits all governance system when it

comes to delivering education across Ontario (Governance Review Committee, 2008). The Ministry provides funding to the boards and the boards allocate those funds given the educational needs of each school within its district.

Elementary Schools

At the most fundamental level, elementary schools are an avenue to deliver education opportunities to school aged children. However, the provinces' strategic direction requires more on the part of the school than simply delivering the curricular content. To achieve high student learning, schools must foster a positive learning environment; an environment where students' physical, emotional and cognitive needs are met. Schools that have been able to foster this type of environment have excellent teachers, highly motivated staff and students and a shared sense of community (Parker, Grenville & Fessa, 2011). School staff (such as teachers, administrators, and education assistants), know and understand the students in their school, and understand their specific learning needs. They have the ability to ensure that all the pieces of the puzzle come together to support individual and collective student achievement (Parker et al., 2011). Schools advocate for their students and are the bridge between the individual learners and the greater education system.

Constructivism: Early learning theory as a means to constrain teaching practices

Hartley (2006) asserts that teaching practices informed by learning theory produce positive learning experiences that foster higher student learning outcomes. Thus, to

investigate scholarship in elementary education, early learning and development must be understood, as it informs excellent teaching practices.

Current educational research demonstrates a constructivist epistemology which assumes that learning is an active cognitive process. The term active refers to the conscious or unconscious activity of the mind to organize knowledge of the environment (Piaget, 1976/1972). As such, human beings do not passively receive and represent information in the same way. For example, two students may encounter the same instruction but may make a different meaning of it. This is the process of "…continual accommodation to and assimilation of information…" (Rovegno & Dolly, 2006, p. 244). To assimilate something is to construct a scheme, or understanding, about a piece of information that has been experienced (Piaget, 1976/1972; Piaget, 1978/1976). For example, a young child will have created a scheme about a carrot that it is mushy, in a jar, and sweet, but as the child develops he or she accommodates his or her idea of what a carrot is by reconstructing the knowledge of the carrot as a root of a plant that grows in the ground, soft only when cooked, and good for the eyesight. The accommodation is essentially gaining new insight or awareness of an existing concept (Piaget, 1976/1972). Early learning experiences are integral to all other learning across the lifespan since these experiences are often the 'firsts'. In other words, elementary teachers provide opportunities for students to develop knowledge; something to accommodate and assimilate.

Social encounters act to validate constructions, and classrooms ought to provide a safe place where students can ask questions in order to develop an understanding. For children to develop a deep understanding of concepts the teacher ought to set up

instruction to provide plenty of opportunity for students to interact with teacher and peers. Piaget (1976/1972) indicates that when children gain new experiences, their experiences either fit their current explanations or do not, in which case they must reconstruct their explanations to bring balance to the internal state of the mind. In other words, the external reality must fit with the internal reality, a process Piaget (1976/1972) calls equilibration.

Liu and Mathews (2005) Rovegno et al. (2006) and Wink and Putney (2002) indicate that the social environment is integral to student learning, suggesting that individuals learn through social experiences and refine thought through intersubjectivity, the process of shared learning. Individuals come together starting with their own personal understanding of a topic, and after interacting socially with one another, come to share the same conceptualization. Teachers can provide a learning environment where students can discuss, explore and create learning together, by utilizing appropriate instructional and pedagogical practices. For example, teachers can set up students' desks in groups, use think-pair-share activities, and assign collaborative group projects in order to provide opportunities for positive social experiences for learning to first be encountered on a social level and then internalized and used as a tool for thought (Liu & Mathew, 2005; Wink & Putney, 2002).

Further, Liu and Mathew (2005), Rovegno and Dolly (2006) and Wink and Putney (2002) assert that teachers can enhance learning through scaffolding. As a more knowledgeable member of the learning community, the teacher can meet the students at their own level of understanding and help guide learning from there. This level of understanding is different for each individual, and is what Vygotsky (as cited in Wink &

Putney, 2002) considers the zone of proximal development (ZPD). The ZPD is a student's ability to successfully solve a problem or complete a task with assistance or independently.

Piaget (1965) asserts that cognitive maturation can be described in stages, where cognitive maturation precedes particular cognitive functioning and learning, just as physical maturation precedes mature movement patterns, such as walking to running (Hock, 1999). In this sense, duration is a key factor in the intellectual development, and some logic cannot be learned through social experiences until a certain level of maturation has been reached.

Teachers learning about teaching

While constructivist theory provides insight for the process of learning throughout childhood and into adolescence, it does not emphasize adult learning and thus, teachers' learning about how to teach. Early constructivist theory provides the means to recognize exemplary teaching in the elementary school classroom, by constraining teaching strategies that reflect how learners learn (Rovegno, et al., 2006). However, if we are to understand and describe progression on the teaching continuum, we must understand how teachers, as adult learners, form deeper insights about their teaching practices.

Mezirow (1991), known for developing the theory of transformative learning, explains that the essence of being human creates an "urgent need to understand and order the meaning of our experience...", and when individuals are unable to understand they revert to traditions, beliefs from authority figures, or use various psychological mechanisms, such as rationalization or projection in order to make meaning (p. 3). The

theory of transformation is a constructivist adult learning perspective and describes how adults form new insights and develop intellectually over time. A number of scholars have influenced the theory of transformation, including Freire (1996/1968), Bruner (1996), Kichener and Habermas (as cited in Mezirow & Associates, 2000). The theory of transformation asserts that in early development and into adolescence, individuals have constructed *frames of reference,* or *forms,* and through adult learning these frames of reference are transformed to create more justifiable and true frames of reference (Mezirow & Associates, 2000).

As noted in the previous section, early learning theory is integral to providing the frames of reference that are transformed during adulthood. However, Boyer (1990), Bruner (1996), Friere (1996/1968), and Mezirow and Associates (2000) all insinuate that pedagogy, instruction and curriculum are of little importance in the case where basic survival needs are not being met. The social inequity is the cause of deprivation of basic needs, thus, stunting students' human growth and development. In analyzing adult higher learning, Bruner (1996) recognized that deprivation in early childhood impacted social and cognitive growth even into adulthood, which inhibited cognitive functioning. His experiments established two distinct characteristics that all infants sought after, two-way human interaction and self-initiated activity or active exploration (Bruner, 1996). Bruner (1996) noted that infants born into poverty were provided with less opportunity for active exploration and lacked responsive social environments that allowed for them to flourish. Thus, Bruner (1996) had recognized that a 'man-made state of affairs' of social and cultural inequity, was depriving children of opportunities for healthy growth affecting their ability to effectively make and interpret meanings which ultimately had proven to

impede growth throughout later years. Piaget's (1976/1972) research also provides evidence of this concept theoretically, when suggesting that variations in cognitive development are a result of environmental factors. Thus, scholars of early and higher learning recognize that non-education factors are drastically impacting pedagogy, curriculum and instruction.

Teaching for transformation

Transformational theory illustrates an ontological view that the ultimate purpose for knowledge is to develop human potential through individual, social, political and historical awareness, consequentially, transforming history (Bruner, 1996; Freire, 1996/1968; Mezirow 1991; Mezirow and Associates, 2000; Takaya, 2008). Mezirow (1991), states that Freire (1996/1968, 1996/1992) had a major influence on the development of his transformative learning theory, by providing him with the critical dimension of the learning process. Freire (1996/1968), informed teaching practice in adult education that is complimentary of a social constructivist learning theory with the addition of a critical and political lens (Shaull, 1970; Wink, et al., 2002). He ultimately sought the utilization of pedagogy to bridge the gap between education and social change (Schugurensky, 2011). Much of Freire's (1996/1968; 1996/1992) pedagogical expertise was a reflection of his philosophical assumptions about humankind. He notes that humanization has always been a central concern for man with dehumanization, as a result of oppression, stunting human growth and thus human potential (Feire, 1996/1968; 1996/1992). Mezirow (2000) notes this same principle, suggesting that the potential for full human development is dependent on values such as "freedom, equality, tolerance,

social justice, civic responsibility and education" (p. 16). Furthermore, Freire (1996/1968), believes that in order for man to progress towards full human potential he must be freed from oppression.

Much of Freire's (1996/1968) critical lens and educational theory can be attributed to his experience as an adult educator in third world countries; where illiterate adults faced oppression that stunted their humanity (Freire, 1996/1968, 1996/1992; Roberts, 2010). For Freire (1996/1968), oppression is the domination and discrimination through class, gender, race, ethnicity that often held individuals in what he described as a 'culture of silence'. Freire (1996/1968) recognized that education systems are a reflection of political institutions and as such, it enabled the *culture of silence*. He also saw this as a driving force of global oppression that he described as a "defining theme of the twentieth century" (Roberts, 2010). Politics underlies all educational contexts from the personal views of both teacher and student, to the layout of the classroom and the content presented, or not, in text books, and curriculum (Roberts, 2010). In this respect, teachers must reflect on the curriculum they are being asked or asked not to teach.

In seeing a desperate need for change, Freire (1996/1968) used dialogue to foster freedom through education. He asserts that knowledge is gained from dialogue, practice, and engaging the realities of everyday life, in other words, learning occurs when lived experiences can be connected and reflected on using dialogue (Roberts, 2010). Freire's (1996/1968) *problem posing* or *liberatory* education is a reflection of his emphasis on dialogue in education, opposed to *banking education* which he describes as an oppressive system which enables the culture of silence. It treats people as objects for information deposit, which ultimately lead to domination, since the oppressed "house" the oppressors

inside themselves (Schugurensky, 2011, p. 104). Freire's (1996/1968) liberatory education is meant to empower students and teachers to free themselves through education; after all only through communication can human life hold meaning. Thought has meaning only when generated by action upon the world (Freire, 1996/1968).

Mezirow (2000) also asserts that dialogue provides opportunities for teachers to come to a clearer justification of a particular interpretation or belief. Further, reflective discourse "involves a critical assessment of assumptions" so that collective understanding or a "tentative best judgment" can be established with those involved in the discourse (p. 11). Both Friere (1996/ 1968; 1996/1992) and Mezirow (1991) believed that knowledge can free individuals of the restraints of cultural, social and historical norms. Thus, teachers, in learning about teaching must also be provided with, or create opportunities for collaboration and discourse in order to verify or extend knowledge of practice. However, for teachers to even be interested in engaging in creative or collaborative activities they must find the content meaningful.

Entwistle and Smith (2002) suggests that teachers' perceptions of a given topic, task, or learning situation, impacts whether or not they will attempt to understand ideas, or concepts or simply try to memorize information for superficial reasons. In perceiving a topic or task to be of value, or of relevance, teachers will demonstrate increased motivation to understand, which is indicative of a *deep understanding*. In perceiving a topic or task as unimportant, teachers may demonstrate extrinsic motivation and memorize information to repeat it for recognition or evaluation (Entwistle & Smith, 2002). Not surprisingly, good teaching is conducive to more deep understanding and

intrinsic motivation; where poor teaching is related to extrinsic motivation and surface understanding (Entwistle & Smith, 2002).

Entwistle and Smith (2002) asserts that teaching is impacted by two factors: teachers' beliefs and knowledge about teaching, and the teachers' perceptions of the curricular targeted outcomes and topics. These two factors influence how students choose to learn, and understand, be it surface or deep understanding. In Ontario, the targeted outcomes are established and compiled into curriculum documents by a Curriculum Council (OME, 2014a). Target understanding is different than personal understanding. In relation to the curricular target outcomes, target understanding is just that, understanding what was intended to be understood. Whereas personal understanding is a reflection of teachers experiences, prior knowledge, and values with regard to a target outcome (Entwistle & Smith, 2002). In other words, teachers are passionate in teaching the disciplines they are enthusiastic about, and skim over ones they know little of. Entwistle and Smith (2002) also suggest that assessment driven achievement, that tests facts and terms, is resulting in a generation of strategic learners, those who get by skimming the surface; while Boyer (1990) asserts that "the work of higher learning, at the core, is and must remain disciplined inquiry and critical thought (p. 69). As such, teachers learning about teaching, must seek to develop pedagogical content knowledge, which as Boyer (1990) asserts can be gained through research, synthesis, practice and teaching in a given discipline.

Deep learning: The need for reflective practice

Reflective practice has been well established as being integral to higher learning. Habermas (as cited in Mezirow & Asociates, 2000) has contributed to transformational theory by suggesting three domains of learning, instrumental, communicative and emancipatory. The first two domains give way to emancipatory learning as a result of reflection on communicative and instrumental learning. In other words, emancipatory learning is not a separate learning domain but is the result of learning that is accompanied by transformation in frames of reference of both instrumental and communicative domains.

For further explanation, the instrumental domain involves manipulation of a learning environment for a purpose, such as utilizing specific instructional strategies to emphasize a particular learning goal. Learning in the communicative domain involves understanding what students are communicating, inclusive of feelings, values and intentions. For example, a teacher may utilize a discussion based activity to increase students' reading comprehension. As a result, many students communicate a lack of interest through body language and lack of focus. The teacher then must reflect on these two learning domains to gain a deeper insight about the learning experience. These reflections are central in all dimensions of teaching, curriculum, pedagogy and instruction. In reflecting on curricula, the teacher in the above example, may question whether the text used for the discussion was appropriate; in reflecting on instruction, the teacher may question how well he or she mediated the discussion; and in reflecting on pedagogy, the teacher may question whether the learners' needs were addressed. The result of the reflections give way to emancipatory learning, thus transformation.

Mezirow (1991) asserts that reflection can assist with instrumental learning by assessing our interpreted options in order to inform our next move, or problems that have risen during the process of our action. This is also considered by Shulman (2004) as reflection-in-action.

Furthermore, Kreber and Cranton (2000) attribute teachers' transformative learning about teaching to reflection of content, process and premise in all three teaching dimensions. *Content reflection* addresses technical knowledge about the teaching process in all three dimensions of teaching. In continuing with the above example, content reflection for the instrumental domain would include technical knowledge about mediating the discussion. Content reflection in the curriculum dimension may include reflecting on expected learning outcomes, content reflection in the instruction dimension may include what type of instructional strategies will be implemented to teach the chosen content; content reflection in the pedagogical dimension may address what actions will be taken to engage students in the activity (Kreber & Cranton, 2000).

Process reflection occurs during teaching, as reflection-in-action (Kreber & Cranton, 2000). When engaging in process reflection in the instructional dimension of teaching we may question the effectiveness of the instructional strategies. In the pedagogical dimension we may question how the students are experiencing the lesson, and in the curriculum dimension we may question if the curricular goals are being met.

Premise reflection questions the relevance of the choices we make in the three dimensions of teaching. In the curricular dimension premise reflection may question what the relevance of the content is for these students. In the instructional dimension, premise reflection questions the purpose of choosing specific instructional methods, tools or

evaluations. In the pedagogical dimension, premise reflection may question the purpose of teaching in a certain way (Kreber & Cranton, 2000). The reflections that occur during the teaching process provide a foundation for learning, the knowledge that informs our reflections may come from a variety of sources, such as research, theory, dialogue and practice. Consequently, the action that grows out of these three reflective processes is essential for transformative learning because ultimately it is the action taken in response to the reflections about teaching and learning that transforms teachers' frames of reference about teaching.

A teachers' *premise reflection* in the curricular dimension, may question the purpose of teaching the curricular content. A teacher may reflect on the *process* of delivering the curricular content and question what of the curriculum do the students presently understand. And in reflecting on the content in the curricular dimension the teacher may question what he or she knows in relation to curricular expectations. The same is true for instruction and pedagogy. In reflecting on the content of instruction, a teacher may question how to mediate a discussion based activity. In reflecting on the process in the instructional dimension a teacher may question how effective this instruction is in relation to the learning goals. In reflecting on the premise in the instruction dimension a teacher may question why a particular instructional approach ought to be utilized. In reflecting on the premise in the pedagogical dimension a teacher may question why adapting to students' needs is necessary. In reflecting on the process in the pedagogical dimension, the teacher may question whether the students' needs are being met. In reflecting on the content in the pedagogical dimension the teacher might question what he or she knows about his or her students' needs.

Teachers who wish to excel in their profession, must move beyond the classroom for higher learning. As noted, higher learning requires teachers to gain experience and then reflect and dialogue and reflect again on the experience. Making and interpreting meaning through dialogue with others is essential for epistemic cognition and emancipatory learning, which both may result in transformative learning. However, the key to transformation is the reflection, more so, reflective action (Mezirow, 1991; Mezirow and Associates, 2000). It is this reflective action that encourages progress on the teaching continuum (Kreber, 2002; Kreber & Cranton, 2000).

The Ontario Curriculum

The Ontario curriculum is developed by the Curriculum Council. The Curriculum Council, established in 2007, is comprised of "knowledgeable community leaders and education experts," who advise the Ministry of Education on strategic policy and curriculum directions (Anderson & Jaffarr, 2003). The Ontario curriculum has gone through reform over the last twenty years and in 1997, the common curriculum, which was comprised of expectations of learning from grades 3, 6 and 9, was replaced with the Ontario Curriculum (Anderson & Jaffarr, 2003). The Ontario Curriculum was comprised of learning outcomes and standards of achievement for grades K-12, with broad and specific learning goals outlined for each grade. The curriculum also outlines the Ministry policies that schools must adhere to including policies specific to global, environmental, inclusive, and equitable education. The curriculum also outlines the roles of teachers, students, parents and principals, and implicates all vested parties as being responsible for the learning and development of each individual (OME, 2014)

Curriculum expectations of students, parents, teachers and principals

Students are encouraged to take responsibility for their learning by putting effort into their learning. They are encouraged to pursue opportunities outside of the classroom to enhance their knowledge of content and concepts taught. In circumstances where students have a difficult time fulfilling this role, the curriculum encourages teachers and parents to practice patience, and continue to encourage students, and reinforce positive learning behaviors. In accordance with the curriculum, parents serve and are recognized as a tremendous support for their child's learning. Parents are encouraged to become familiar with the curriculum, in order to understand and discuss with their child the content and concepts taught. Becoming knowledgeable about the curriculum will allow parents to better communicate to teachers about their child's learning. The teachers' role is to ensure adequate instruction, and methods for evaluation, to support learning by developing reading, writing and communication skills and to bring enthusiasm and passion to the curriculum while addressing individual student interests and needs. The Principals' role is to support teachers and parents by providing the necessary means to enhance student achievement. The Principals are expected to ensure the Ontario Curriculum is being implemented properly in all classrooms, using a variety of instructional approaches that meet the diverse needs of each learner. They are expected to provide the resources necessary for teachers and students, and to promote learning teams, and provide opportunities for teachers to continually grow through professional development opportunities.

Ontario College of Teachers: Foundations of Professional Practice

The Ontario College of Teachers is a self-regulating body established in 1996, and governs accreditation of teacher education programs, teacher certification, the disciplinary actions of its members, and specific to this investigation, provides the Foundations for Professional Practice for elementary teachers in Ontario (Anderson, et al., 2003). The Foundations of Professional Practice (FPP) have five initiatives that are aligned with Boyer's (1990) idea of scholarly teaching. Its five initiatives are: commitment to students and student learning, leadership in learning communities, ongoing professional learning, professional knowledge, and professional practice, which both emphasizes scholarly activity as a means to inform practice, requiring teachers to "…reflect on student development, learning theory, pedagogy, curriculum, ethics, educational research…" and "…refine their professional practice through ongoing inquiry, dialogue and reflection" (Foundations of professional practice, 2010, p. 13). Moreover, the FPP also refers to legislations that require ongoing professional learning in order for members to remain a part of the Ontario College of Teachers.

Professionally Speaking: Ontario College of Teachers Magazine

Professionally speaking is the magazine for the Ontario College of Teachers and was developed in 1997 when the Ontario College of Teachers was brought together. The magazine provides a forum for teachers, principals, administrators, and union representatives, to name a few, to share knowledge about teaching and learning, to share inspirational stories, strategic directions, provincial and federal initiatives and much more. The magazine can inform its readers about key political and social agendas as well

as current and historical values that impact and are impacted by teaching and learning. The articles represent the voice of Ontario's teaching and learning community and can deliver great insight into the current state of our elementary education teachers' practices, and perhaps where they stand on the teaching continuum.

CHAPTER 3: METHODS

Introduction

Elementary education provides the fundamental knowledge and skills to support complex ways of thinking and understanding. The ability to think and understand complex ideas and concepts is crucial to future academic success and emotional, and intellectual well-being (OME, 2006). With the advancements made in science and technology, all students are now expected to reach a level of skill that was once thought to be in the reach of only a few (Darling-Hammond, 1996). Teachers have the opportunity to facilitate the learning process and are the single most significant school related factor impacting a child's learning in elementary school. Teaching at its best, can have a lasting positive impact (Eby, Herrell, & Jordan, 2006; Tileston, 2000). However, on the other end of the continuum, poor elementary teaching can have a lasting negative impact on student learning and has even been linked to higher student dropout rates (Barile, Donohue, Anthony, Baker, Weaver & Henrich, 2012).

Background

The basic purpose of teaching is to assist students in learning more efficiently than they would on their own (Angelo, 1996). Not more than 40 years ago teachers were hired right out of high school, all pedagogical and instructional knowledge stemmed from their experience as learners, and their experience as practitioners. Now, teaching has become a professional practice where knowledge of teaching and learning has progressed with high academic standards for qualification. Fortunately, research in educational and

developmental psychology has given us a greater awareness about learning and consequently, has influenced our teaching practices, most certainly helpful for today's modern classroom.

In a typical elementary classroom a teacher is expected to guide the learning of 20-30 students simultaneously. A teacher is also expected to keep the entire class on task, interested and engaged by catering to each student's developmental level, prior knowledge, learning style and interests (Jensen, 2009; Tileston, 2000). This is nothing new; this is what many excellent teachers do on a daily basis.

The problem however, is that elementary teaching is never static and teachers are often shuffled to different grades, different disciplines and even different schools. In order for elementary teachers to consistently ensure a solid foundation for each student they must themselves accumulate new knowledge with respect to the changes they must endure. With each new grade, new instructional, curricular and pedagogical knowledge is required. With little information about where this new knowledge is gained or if it is sufficient, how can we expect our elementary educators to fulfill their role?

Purpose of the Study

The purpose of this study was to investigate Boyer's (1990) four dimensions of scholarship in relation to elementary teaching as a distinct discipline, and in relation to elementary teachers as scholars. The questions that will guide this study are:

1. What sources have informed elementary teachers' classroom practice with respect to curriculum, instruction and pedagogy?

2. How have elementary teachers gained knowledge of instruction, curriculum and pedagogy?
3. How have elementary teachers contributed to the production and teaching of knowledge with respect to curriculum, instruction and pedagogy?
4. What teaching practices are enacted by elementary teachers?
5. Do we have scholarly teaching in elementary education?

Methodology

Qualitative Research

A qualitative approach to research was used in this investigation. Qualitative methodologies are unique in that they are oriented towards real world everyday problems and situations, and allow for a depth of information in place of breadth (Patton, 2002). Furthermore, they are effective for exploring new topics that are yet to have been explored (Creswell, 2007). Qualitative research seeks insight through the quality of words, phrases, actions and behaviours, rather than quantity, meaning, rather than numbers. There are three kinds of qualitative data: interviews, observations and documents. In using interviews, open ended questions probe for responses that inform feelings, opinions, knowledge and experiences. Observations describe behaviors, actions, and activities that shine light on particular phenomena. Documents, as will be the data for this investigation, include studying articles, quotations, diaries, reports, and so forth that preserve context of a given phenomenon (Patton, 2002).

As Creswell (2007) indicates, the “backbone of qualitative research is the extensive collection of data, typically from multiple sources of information” (p. 43). So

for the purpose of this investigation, and in using a document qualitative analysis, four different kinds of documents were explored in seeking information regarding the enactment of scholarly teaching in elementary education. As mentioned, there is a multitude of methods to qualitative design, in using documents as the source of data, my main method of analysis is a content analysis. Generally, in a hermeneutic content analysis of unobtrusive data sets, the data are analyzed for themes and patterns (Patton, 2002). In this investigation, the content was analyzed for the quality or meaning of the content given the theoretical lens rather than frequency of wording or other linguistic patterns. In other words, how often the word 'experience' appeared in the data was not as integral as the context under which the word was used. Furthermore attention was also given to the manifest and latent representations within the documents.

Data Set

All documents used in this investigation are public documents; therefore they require no ethics approval. In order to investigate the enactment of scholarly teaching, data were gathered from four sources of information. The December, 2012 issue of the OCT's Professionally Speaking Magazine (PS) was chosen because it was the most recent issue at the time of data collection (Professionally Speaking, 2012); the Ontario Health and Physical Education Curriculum (OHPEC) (OME, 2010); the OCT's Foundations for Professional Practice (FPP) (OCT, 2012) and the criteria for the Prime Ministers Award for Teaching Excellence (PMATE) (Government of Canada, 2014).

Hermeneutics

As mentioned previously, qualitative research provides a multitude of methodological options. To guide this investigation I used a hermeneutic orientation to interpret the data. Hermeneutics is a perspective for interpretation, and was first developed by Frederich Schleiermacher (Patton, 2002). It offers a way to interpret text keeping in mind the original context and purpose of the text. In other words, to interpret a text, the interpreter must seek to understand what the author intended to communicate in light of the social and political context in which it was written (Patton, 2002). However, in this regard, it is impossible to completely separate the historical factors that have impacted elementary teachers' professional practice, especially from those who have been through the political and cultural changes that have led to so much education and curricular reform over the last three decades.

As previously discussed, hermeneutics requires the investigator understand purpose, context and underlying messages of text. In this regard, PS was chosen because it is a representation of the Ontario elementary teaching population, and it is published to inform members about "the activities and decisions of the college" and "to provide a forum for discussion for issues relevant to the future of teaching and learning, professional learning, and standards of practice (PS, 2012, p. 6). Thus, to understand what is happening with respect to scholarship, the PS magazine, as a forum for teachers, demonstrates which resources, tips, strategies and supportive articles are indicative of common practice. This document is a primary source of data, because the articles are written by teachers and therefore, represent the voice of the teachers. In analyzing the content I sought evidence of excellence, expertise and scholarship through the stories and articles written by the teachers for the teachers.

As mentioned previously, OHPEC, FPP and PMATE cannot directly inform us of what was practiced in terms of curriculum, instruction, and pedagogy, as PS can, but it can be indicative of what is expected, and therefore, what is likely influencing practice. Boyer's (1990) conceptualization of scholarship was holistic, meaning not simply discovery of knowledge and publication, but also application and integration of knowledge and scholarly engagement with and on teaching and learning. Knowing that the OHPEC is a significant resource that informs elementary teachers' knowledge and practice, I sought evidence of excellence, expertise and scholarship in what is expected of teachers, providing a glimpse of what knowledge is being disseminated, integrated, and applied and perhaps how teachers are expected to gain knowledge of teaching. As with the OHPEC document, in investigating the FPP, I sought evidence of excellence, expertise and scholarship in what is expected of teachers, assuming that teachers are likely to practice what is expected in the profession, given the standards are mandated to all elementary teachers practicing in Ontario publicly funded schools. Further, the OHPEC and the FPP are resources that all Ontario teachers ought to have consulted, thus it serves to help us understand what knowledge about curriculum, instruction and pedagogy is being disseminated through this resource.

PMATE may also provide a strong sense of what may be practiced with respect to excellent teaching since recipients are chosen based on the evidence provided in the criteria. Further, the criteria for excellence in teaching will be beneficial to investigate because it is indicative of what is valued in teaching, and cultural values often underlie behavior (Donatelle, 2011). Also, in order to define and differentiate between excellent, expertise and scholarly teaching, and a significant aspect of the theoretical framework, is

Kreber and Cranton's (2002) conceptualization of a teaching continuum. In this respect, excellence must precede expertise, which must precede scholarly teaching. So in essence, to gauge scholarship we must also look to that which must precede it. In other words, to infer scholarly teaching in elementary education, we must also have strong evidence of teaching excellence and expertise that precedes scholarly teaching.

As previously mentioned, PS serves as a forum and may shine some light on the curricular, instructional and pedagogical practices of elementary teachers, but does not represent what activities are expected in the elementary teaching profession. As stated in the first section of all PS magazines "[t]he views expressed in the articles are those of the authors and do not necessarily represent the official position of the college" (OCT, Professionally Speaking, Dec 2012, p. 6). On the same note, investigating OHPEC or FPP will not provide primary examples of teaching practices since the documents are intended to define expectations and guide practice in the elementary teaching profession.

In analyzing PMATE, an assumption can be made of the award recipients; that is, they ought to hold the attributes 'expected' of them as defined in the criteria. This document serves to understand what is expected in elementary teaching excellence, by way of the practices excellent elementary teachers ought to be engaged in. The same is true for both OHPEC and FPP. Since the OHPEC and the FPP are required in the profession, to be implemented, than we can assume that many elementary teachers will meet these expectations. Therefore, it will serve our investigation to understand what it is that is required in elementary teaching practice. Further, to understand what teaching practices are highly valued in the profession, as can be gauged by the PMATE, may facilitate greater understanding of the types of practices we can expect to see in the

classrooms, whether that be practices that are demonstrative of excellence, expertise or scholarly teaching.

Hermeneutics can be applied to "...establish context and meaning for what people do" (Patton, 2002, p. 115), and requires the researcher to interpret the meaning based on a given perspective or theory. In this case, I will interpret the text from Professionally Speaking using a framework driven by the research questions that are indicative of scholarship. Given the nature of qualitative research, the data may be interpreted in a variety of different ways depending on the researcher, and theoretical lens used; in other words, "[i]t must remain only and always an interpretation" (Patton, 2002, p. 114). That being said, my personal lens of viewing and interpreting the world around me is rooted in a constructivist philosophy.

Constructivism as an underlying philosophy

Angelo (1996), asserts "…that the most meaningful measure of teaching is student learning..," thus, excellent teaching must be a reflection of how learners learn (p. 57). Constructivism is a philosophy and a theory of learning and adaptation. As a learning theory, it asserts that knowledge is cognitively and socially constructed by individuals and is impacted by personal and environmental factors (Domenici, 2007; Dykstra, 2010; Liu & Mathews, 2005; Mascolo & Pollock, 1997; Patton, 2002; Piaget, 1976/1972; Raskin, 2009; Rovegno & Dolly, 2006). However, in order to understand constructivism as a learning theory, the philosophical assumptions that underpin it must be understood.

As a philosophy, constructivism is ontologically relativist and realist (Domenici, 2007; Mezirow, 1991; Piaget, 1980/1974; Raskin, 2009). Relativist, because individuals

construe a world relative to their own experiences, realist, because, as the anthropic principle suggests, "we see the world as it is because if it were different we would not be here to see it" (Hawking, 1988). In other words, if an external reality did not exist we would not be here to construe it (Deminici, 2007; Piaget, 1965/1930; Raskin, 2009). For example, we see a building because it is there, whether we see it as an apartment or an office building is dependent on our experiences. Further, the realist notion supports constructivism because many of the factors that impact an individual's constructs are visibly measurable, and therefore reality oriented, which as Patton (2002) asserts, is a part of a realist/positivist orientation.

Epistemologically, constructivism has implications on how people come to understand. As noted, construing is a process of actively synthesizing past and present sociocultural and sensory experiences with biological and physiological states. In this respect, the realist notion of constructivism suggests that we can know some aspects of the construal process. Empirically, we can know genetic properties, salient qualities of a culture, gender, hormones and so on. Moreover, the relative nature of constructivism asserts that what we cannot know is exactly how any one individual experiences life with the exception of that specific individual (Raskin, 2009). However, we can come to understand the essences of being by studying what we can know and using our own constructs to make assumptions about the things we cannot (Piaget, 1976/1972; Raskin, 2009). So when interpreting the text for this study, I come with the assumption that knowledge is built upon, and my prior knowledge and experiences will also impinge upon my interpretation of the content I choose or do not choose to investigate.

In this regard, my experiences and perceptions impact directly what is interpreted and analyzed and written throughout this entire document. I will provide a glimpse of my own background and experiences to provide you with insight into my constructed lens.

I was a high-school dropout, with no real direction, I travelled and held a variety of jobs before realizing that in order to meet my goals I would have to return to education. I subsequently completed my general equivalency diploma, attended Niagara College where I received a diploma in general arts and science. I continued my post-secondary education by obtaining an honours degree in physical education, and a bachelor of education. After graduation I was hired to teach team teach kindergarten at an International Baccalaureate school, where I was also a specialist, developing and delivering the arts, and physical and health education programs for grades 1-6. Through this experience my teaching was teaching developed greatly as I was given a lot of responsibility. I was to collaborate and coordinate with other teachers on how to integrate all disciplines amongst the teachers so that the students would develop a big picture perspective. As well as, we all collaborated and discussed how we can teach learning to our students, and critical thinking, and risk taking. That was on top of connecting learning to expectations set out in the Ontario curriculum. As I was also a homeroom junior kindergarten team teacher, I was given the opportunity to practice teaching and learning in all K-8 disciplines and gained a value for collegial work environments, and the sharing of learning. Research into novice teaching asserts that novice teachers more often than experienced teachers keep their teaching practices private (Westerman, 2003). Essentially, during my first year of a teaching I was fortunate to have a highly collaborative team of teachers, with a deep value for critical inquiry. My experience at

Maple Crest Private School as a specialist and home room team junior kindergarten teacher has also contributed to my diverse pedagogical knowledge as I was challenged to teach grades 1-8 physical education, and the arts.

After my first year, I took maternity leave and had two children, all the while cultivating my pedagogical knowledge at various discipline specific organizations, such as teaching science programs through Mad Science, art programs through In the Orchard Center for the Arts, a lacrosse program through First Steps Lacrosse, and martial arts through St.Catharines Martial Arts Center.

With my maternity leave up, and the poor job market for teaching in my surrounding area, I decided to go back to school for a Masters. During the progress of my graduate education I treated my teaching assistant positions seriously, focusing on connecting with the students so that they would feel comfortable to come to me with any questions or concerns. I also recognized that most of the communication that the students receive from me as the instructor was through written feedback, so I worked hard to assure that students' feedback was specific and constructive, and that it was delivered in a timely manner. I found that many students responded positively to this.

During my graduate education, I was hired to teach a first year Health Promotion course at Brock University where I was able to mold my 'experiential' and 'hands-on' primary education teaching approach to the four walls of the lecture hall. I saw evidence that many students valued their experience with me and the course content. The course emphasized health in terms of a holistic perspective.

What brings me here? I love teaching and learning, and I feel that my voice can inspire others. In my interpretation of the world I unintentionally believe that all people

are able to achieve betterment. Experience, reflection and discourse drive growth and development, as I have grown as a direct result of my own experience, dialogue and reflection.

The experiences previously mentioned has impacted this entire research project from the topic to the findings. Essentially, I chose my topic because I want to be an excellent teacher who will impact the most amount of people possible in the most positive way possible. So, I can say that my interest in teaching and learning, and physical activity has led to my research topic and the deductive analysis.

Data Collection and Management

Gathering the data was simple, all the documents used in this analysis are available electronically and accessible online (See Ministry of Education, 2010; Ontario College of Teachers, 2012; Prime Ministers Award for Teaching Excellence, 2014). Further, the Ontario College of Teachers sends its members a hard copy of the professionally speaking magazine quarterly, and as a member, I have a hard copy of all issues since 2010. Furthermore, I also have a hard copy of the curriculum guide, and Ontario College of Teachers Foundations of Professional Practice from my teacher education program. Although I have hard copies of these documents, I used a combination of manual and computer based techniques for data collection and management purposes. All documents were copied from the electronic version into Microsoft Word. All text features, font size and style, spacing etc. were eliminated and page numbers were added for further reference (See Appendix A).

To assure reliability during the data collection process the four questions that were used to guide this study were rephrased into statements, and assigned a specific color of highlighter to be used in data collection (See figure 2).

	Original question	Original question rephrased into statement
Q1	What sources of information have elementary teachers consulted to inform their teaching practice with respect to curriculum, instruction and pedagogy?	The sources of information that inform this teacher[s] practice is…
Q2	How have elementary teachers gained knowledge of instruction, curriculum and pedagogy?	This teacher[s] gained knowledge of curriculum/instruction/pedagogy from…
Q3	How have elementary teachers contributed to discipline of teaching and learning with respect to curriculum, instruction and pedagogy?	This teacher[s] contributed to the discipline of elementary teaching and learning by…
Q4	What teaching practices are exemplified by elementary teachers?	The teaching practice exemplified by this teacher[s] is…

Figure 2, Questions guiding the study rephrased for reliability in data collection with corresponding color. In order for a meaning unit to be categorized into a particular colour corresponding with one of the four study questions, the text under analysis must complete the sentence corresponding to the question.

In using the rephrased statements I read through entire document (which included the PS, OHPEC, FPP, PMATE) highlighting all phrases, words, or sentences that completed the corresponding sentence under which I was collecting data for. Once the entire document was highlighted, I took the hard copy of the data and made four copies matched it with the electronic version and electronically highlighted all data from the hard copy into its own word document, corresponding to the question in reference, and labeled each highlighted unit in a comment box which I attached to the highlighted text.

Then I created a list of the labels assigned to each piece of text, and those were now what I will consider my meaning units used for the thematic analysis.

Analysis

This investigation was guided by a content analysis approach. As Elo & Kyngäs (2007) assert, content analysis "…is very flexible and there is no simple, 'right' way of doing it (p. 113), and that beginning the analysis is the most difficult part. In consulting my conceptual framework for the deductive analysis, for each research question I categorized keywords and phrases into groups.

Using a typology driven from the literature (see Appendix B), I categorized the groups into themes. This first level of analysis was first completed in hardcopy using a color coding system, I also physically manipulated the data categorizing like comments into themes by hand. This combination of manual and computer based data collection and management facilitated the physical and virtual manipulation of the raw data, essentially, enhancing the pattern-seeking component required for rigorous qualitative research, as suggested by McMillan and Schumacher (1993).

During this process some phrases were split up for further accuracy. For example, a phrase that corresponded with how teachers gained knowledge of teaching and learning was *pedagogy, expertise in discipline.* This phrase was split, pedagogy was placed under a theme and expertise was placed under a different theme. This allowed for more specificity in the analysis.

All four questions were analyzed in this manner for all four documents and our documents. Furthermore, any documents, resources, or web resources that were referred

to in any of the four documents analyzed were also used in the analysis. The analysis was content driven and thus, the quality of the keyword or phrase is emphasized over the frequency to which the keyword or phrase was found. In other words, how many times a specific teaching practice was mentioned was not intended to be under investigation. However, the That being recognized, there may still be some merit when looking at the overall content and what is most represented compared to what is least represented, which was captured in the inductive analysis. Inductive analysis paid attention to manifest and latent content as well as constant recursive comparison of key words and phrases, paying attention to salience and patterns.

Triangulation

Triangulation is used in qualitative research in order to strengthen the research and provide greater validity to the findings. It is a method of looking at the research question from multiple methods, sources, investigators or theoretical perspectives (Patton, 2002). In this investigation I will use a theory triangulation in order to strengthen my findings, analyzing content in the professionally speaking magazine under three theoretical lens': Boyer's (1990) four forms of scholarship; adult higher learning theory (See Entwistle, 2002; Freire, 1996/1968; Mezirow 1990; Trigwell, 2000) and Kreber and Cranton's (2000) implied teaching continuum. Since scholarly teaching is progressive and develops over time, I sought out evidence of teaching excellence by way of teaching practices exemplified or expected of teachers. I sought out evidence of teaching expertise by way of how knowledge about teaching is or expected to be gained, and I sought out evidence of teaching scholarship by looking for evidence that demonstrates how

elementary teachers have contributed to the discipline of elementary teaching and learning.

Furthermore, I used document triangulation to investigate the alignment (or lack of) in what (if any) scholarly activities are expected in the elementary teaching profession in congruence with what is being demonstrated through the PS magazines. Additionally, my data collection and analysis process was checked by my supervisor throughout the process each week, a form of analytical triangulation (Patton, 2002, p. 464)

Trustworthiness

The trustworthiness of this investigation, is first and foremost the knowledge and understanding of the theoretical framework used to guide this analysis. That being noted, I conducted an extensive literature review to inform the theoretical framework and thus my understanding of it. Furthermore, after moving through the process of my study I see that of significant importance to the trustworthiness of this investigations were the supports in place to afford focus in the investigation during data collection and analysis. The study questions, (and rephrased statements) the typology (indicators), and definitions were posted on walls or spread out in front of me; further I had a second computer, and a hard drive. Thus, at the tip of my fingers I had access to all of the literature used in the investigation and more, as well as the raw data, in case I had to recheck my data (i.e., grammar error, or missing letter might cause me to question if there was a mistake during data collection). I also had the World Wide Web, email, and text and phone access to my thesis supervisory committee if ever I was in need of advice. All of these supports

afforded a trustworthy investigation because they allowed for a focused and thorough investigation.

Additionally, in the data collection process, I ensured that I was able to back track my analysis by linking themes to specific comment numbers that are linked to specific documents. Thus, at any time during the investigation or after, I can go back through the process and link it back to the original data, thus there is a clear path informing how I developed the themes and the conclusions I have drawn from them based on the theoretical framework. Further, as an element enhancing the trustworthiness of this investigation, was the supportive, and knowledgeable committee to guide my focus, allow for deep learning of theory, and practice.

Role of the researcher: Rooted in the data

Throughout my years as a learner and teacher I have come to understand that teachers have an amazing potential to inspire learners. I have been inspired time and time again by numerous teachers and out of this I have developed a passion for teaching because I too enjoy inspiring others. This has driven my personal pursuit to become an excellent teacher. So in thinking about my research I immediately gravitated toward the concept of 'effective teaching' and 'excellence in teaching' but was intrigued when I was introduced to the concept of scholarly teaching. Teachers who engage in scholarly teaching are more than effective and excellent teachers, because they are committed to learning about teaching and are not only concerned about their students' learning, but are concerned for the learning of everyone in the greater teaching and learning community.

As the researcher, I have become as Glaser and Strauss (as cited in Patton, 2002) has termed it 'implanted in the data" (p. 454). In the sense that I have read through each document numerous times, understanding it from all aspects of my theoretical framework (essentially from a teaching and learning perspective, from a humanistic – service perspective that is implied higher learning theorists (see Boyer, 1990; Freire, 1996/1968; Kreber and Cranton, 2002). As a teacher of multiple disciplines, and developmental levels, I analyzed my own teaching, attempting to apply my knowledge as I was learning it, reflecting on my own teaching and learning and also how it was relating to my research. However, the process was still difficult.

I experienced much trial and error with regards to my methodology. In this respect, I believe, as Creswell (2007) indicates, that the design for this qualitative research project had emerged as an initial plan for data collection is not always tightly prescribed in qualitative research methods. Creswell (2007) asserts that commonly, in the process of qualitative research, phases of the process will change and shift, including the research questions. In this research process, my data collection method had undergone some major shifts, and as a result of understanding the content and purposes of each document, my questions were modified to suit the purpose of corresponding texts. Moreover, in hindsight, I can see how my early unsystematic approaches delayed my analysis but ultimately allowed me to spend the necessary time with my data sets. In becoming so close with the data I developed a deep understanding of the content under analysis, which has assisted tremendously with integrating data to form meaningful findings, but also added to the trustworthiness of the research.

Limitations

A larger scale document analysis would have provided a much deeper insight holistically. For example, I only analyzed one curriculum document, and one PS magazine. Analyzing all Curriculum documents may have provided a more holistic perspective with regards to specific disciplines practice, just as in a High learning institute, some faculties appear to place higher values on different aspects of scholarship. In reflection, Brock Universities Faculty of Applied Health Sciences demonstrates scholarly teaching practices, which shows in the underlying values found in the documents analyzed. However, I am bias and would have to investigate other curriculum documents, (i.e., disciplines) to understand if they compare to scholarly teaching practices displayed in the documents analyzed including, OHPEC, PS, FPP, PMATE, and with respect to the theoretical conception.

Although, I chose to analyze the PS December 2012 issue because it's title was "Food for Thought" and as I initially sifted through it, there appeared to be an emphasis on health, which I was interested in understanding how it aligned with the OHPEC. A limitation to this is that the content from each PS magazine varies so much that perhaps analyzing only one magazine may have limited the finding with respect to the research questions.

Further, the content in all documents does certainly provide evidence of the teaching practices that are exemplary and valued, however does not necessarily inform of what most elementary teachers are practicing. Thus, more research must be conducted to understand where most elementary educators sit on the teaching continuum.

CHAPTER 4: FINDINGS AND DISCUSSION

Preface to findings presentation

Excellent teaching can progress to expertise, which can progress to scholarship. Furthermore, scholarship and expertise, should not be seen as separate or distinct from excellence as it is merely an extension. Thus, excellence precedes, and is necessary if nothing else, in elementary teaching. Trigwell et al. (2000), and Kreber and Cranton (2000) indicate that the hallmark of an excellent teacher is the quality of student learning. The performance of the teaching is emphasized, rather than the knowledge of teaching. Findings from all four documents suggest that there is scholarly teaching in elementary education. The following section will highlight findings from the deductive analysis from each question, as well as findings from the inductive analysis.

Research Question #1: What sources have informed elementary teachers' classroom practices with respect to curriculum, instruction and pedagogy?

In analyzing the question what sources inform teachers' instructional, pedagogical and curricular classroom practices, markers of excellence were significantly demonstrated. Four themes were found to be of significance: observations of student engagement, attitude and learning behaviours*;* other student data; student achievement; and practice and experience.

Observations of student engagement, attitude and learning behaviours

As PS is a forum for teachers to discuss issues relevant to teaching and learning it comes as no surprise that comments from parents, principals, students and teachers with respect to student engagement, attitudes and learning behaviours, informed classroom practice. Some comments expressed concern for student learning, which afforded new learning opportunities to enhance student engagement, attitude and learning behaviours, leading to student success, while others expressed recognition of successful practice. The comments indicate teachers' experience based knowledge. For example, one teacher had an opportunity to teach in two drastically different school settings, developing classroom practices through the reflection of her students learning in both contexts.

> *Kids love a hands-on, active science class," she says. "We do labs at least once a week. I know my previous students didn't get the concepts I taught them as quickly or easily because I was teaching from a textbook instead of in a lab. Hands-on learning is vital to engage kids in science. (PS, 2012, p. 53-54)*

In analysing the comments, it was apparent that when students' needs were not being met, engagement, attitude and behavior were significantly impacted, which informed teachers of an issue that affords reflection.

> *Braydon came to Superior Heights to escape years of bullying. By Grade 6, his parents say he had no friends, poor grades and a poor attitude toward school.* (PS, Dec. 2012, p. 55)

Knowledge about student engagement, attitude, and learning behaviours proves to be of value since it is likely to lead to action for the purpose of enhancing student learning or teacher practice. For example, one principal's comment regarding students' engagement, attitude and behaviour, was followed up by a drastic change in instructional and pedagogical practices that led to the success of the students.

> *Some had become disengaged for a number of reasons… many were experiencing social, emotional and academic challenges. Although not all of them were on IEPs, they all had particular needs we could address in a smaller, intimate setting* (PS, Dec, 2012, p. 55)

Cross (2000) asserts that educational research aims to enhance the quality of student learning, thus, any research that enhances the quality of student learning ought to be considered in the greater picture as research. In this sense, the teacher observes the student's attitude, behaviour, and engagement, then uses the knowledge to support student learning by altering instruction, curricular, and pedagogical practices. This theme shows teachers' pedagogical awareness and learner centered teaching, which Trigwell et al. (2000) suggests is an attribute of excellence, since the teachers move from focusing on the content of their instruction to focusing on student learning and experiences.

In accordance with OHPEC, seeking information about student behaviours, attitudes and engagement is not only valuable, but essential for learning, and this can only be learned through direct experience. It is through the lived experience that the teacher will learn and understand individual student needs, which in consequence will impact instructional and pedagogical practices, and curricular objectives. This is as Schön (1986) describes, reflection on action and in action. Trigwell et al. (2000) in extending

Boyer's (1990) concept of scholarship, suggested four ways that teachers gain knowledge about teaching: formal research, collaboration, literature and experience. Excellent teachers can, and must gain knowledge through reflection on experience, just as the teacher above exemplified reflection on action. Kreber and Cranton (2000) and Trigwell et al. (2000) would indicate that the above comment is knowledge gained through practice and experience, also described as experimentation and reflection, which is essential for excellent teaching.

Essentially observations of student engagement, attitude and learning behaviours contribute to teachers' discovery of new knowledge for application purposes. Boyer's (1990) concept of scholarship of discovery asserts that discovery of new knowledge requires rigorous research methods that result in a marked contribution to the whole discipline of teaching and learning. Furthermore, the scholarship of discovery also requires peer review in order to critique, adapt or extend the knowledge that was discovered. In this regard, teachers are not necessarily involved in the rigours of research, thus scholarship of discovery, but are in fact gathering data that does provide knowledge specific to the learning context, thus discovery of knowledge for application. Patton (2002) expresses applied research as the following: "[t]o contribute to knowledge that will help people understand the nature of a problem in order to intervene, thereby allowing human beings to more effectively control their environment" (p. 217). In this respect, both Cross's (2000) and Patton's (2002) concept of research as applied, would support the notion that elementary teachers are in fact researchers, but the knowledge discovered and used in the confines of one classroom make the knowledge limited to context, space, and time (Patton, 2002). In other words, teachers' knowledge discovered

through observations of students' engagement, attitudes and behaviours contribute to experience based pedagogical content knowledge. This suggests excellence in teaching and scholarship of application, since knowledge discovered about student engagement, attitude and behaviour, guide instruction, pedagogy and curriculum. This is the hallmark of excellence; utilizing the knowledge of pedagogy and instruction in the context under which it was discovered, since that is where it will be of the most use. The following comment demonstrates how a student who had been struggling with school had experienced great success when instruction, and pedagogy were adapted to meet his learning needs.

> *He's a star,' they said. My husband and I looked at each other, thinking, 'Is this our son?' I cried right there in the room," she says. "They caught him before it was too late. We know he's safe and learning and having fun at school with a good group of friends. They saved our son.* (PS, Dec, 2012, p. 55)

Observations regarding student attitude, engagement and behaviour indicate teachers gain knowledge from experience, and reflection on action. Essentially, teachers' insights gained from their experience was used to intervene in the learning process, or to recognize and share successful teacher practices. To whatever degree teachers are involved in the rigours of basic research, the data which they collect, be it qualitative, or quantitative gives rise to the discovery of new knowledge, for application purposes. Evidently, the new knowledge is used to enhance quality in student learning, as in Cross's (2000) concept of educational research, as well as in the rigours of traditional research. Additionally, however formal or informal the research, the knowledge

discovered brought to light an issue of successful practice; some tangible aspect of teaching that can be discussed, extended, modified and manipulated to better student learning outcome. As Shulman (2004) expressed, student learning outcome is integral to the development of teaching.

Other student data

As Kreber and Cranton (2000) indicate, "teaching effectiveness can be inferred from the product that was created; it is the product that is the indicator of scholarship" (p. 477). Similar to observations of student attitude, behavior and engagement as a source of data to inform classroom practice, other student data such as number of visits to the principal's office, student attendance, data recorded in Ontario student records (OSR), also impacted teachers' classroom practices. Similar to observations of student engagement, attitude and learning behaviours, other student data may not necessarily inform the content of teaching practice, but does bring to light issues that ought to be addressed by way of altering teaching practices, be it pedagogy, instruction, curriculum, or all three. Thus, action initiated out of the student data was used to alter the teaching practice for the purpose of addressing an issue that was hindering student learning, which indicates application of knowledge. In all cases, the students found success after these learning contexts were altered to suit the learners' needs. The following excerpt demonstrates how the knowledge of other student data assists with placing students in a learning environment that is more conducive to their learning needs.

> *What would likely happen to these kids if they were back in their elementary school? Many of them would struggle academically, which in turn would lead to misbehaviour*

> *and often removal from class. "I'd see a whole lot more of them in my office," he [Principal] says "we see it in their OSR's [Ontario Student Records], when they come to us after grade 6, poor attendance, high suspension rates, behaviour issues. These are frustrated kids starting to disengage*. (PS, Dec, 2012, p. 55)

PMATE also considers attendance rates and student participation in extracurricular activities as a measure of excellence. In essence, this would indicate that teachers who have been awarded for teaching excellence ought to have contributed to high student attendance, and participation rates.

In using OSRs to inform teaching practice, teachers do not necessarily learn what to do, or how their practice can be informed, as much as they learn about particular student needs, and how the teacher will plan instruction.

The Ontario Student Record Guide (OME, 2000) describes OSRs as being used solely for the purpose of improving student learning, and teachers are suggested to review the students OSR often "to ensure that they remain conducive to the improvement of the instruction of the student" (p.17). A teacher, and recipient of the PMATE, describes how she reviews OSRs prior to meeting her students as a means to "develop strategies on how to work with those who have learning challenges or are painfully shy" (PS, Dec, 2012, p. 19). Thus, student data can be a valuable tool for application.

Teachers in elementary education focus on providing success for the students in their classroom, which generally happens in the privacy of their own classrooms. Research has shown that novice teachers have a greater concern for their own teaching practice rather than student learning, and thus, tend to keep their practice private (Westerman, 2003). This is contrary to the notion of scholarship which seeks to open up

teaching and learning for peer review, validation, and to extend the growth of the discipline. OSRs prove valuable because they are mandated by the government, so even if teaching practices are kept private, student learning outcomes are shared among the community of educators who are concerned with each particular student. Further, the massive accumulated body of data stored in OSRs has been used in numerous research studies that have contributed to the discipline of elementary teaching and learning (see Canadian Council on Learning, 2008). That being said, to the elementary teacher, basic research appears less significant than student learning.

Student achievement

In analyzing OHPEC, FPP and PMATE, assessment was expressed as a significant source to directly inform teachers' classroom practices. The OHPEC implicates assessment as a main source to inform teachers' practice, and FPP requires that members of the Ontario College of Teachers use assessment and evaluation in planning for and responding to individual student needs. However, in searching through the content of PS, I was surprised that there was very little mention of assessment practices. The only mention of assessment in PS appeared in a book review on assessment strategies. However, assessment can be inferred in the respect that teachers must have used some form of assessment in order to gauge student learning. For instance, one math teacher explained teaching as negotiating between what the student and teacher understands about a topic. In essence, applying this knowledge requires the teacher to assess students in order to draw conclusions about what the student knows, for negotiation to be possible.

This implies a student centered pedagogical approach, since the student becomes the focus. Teacher assessment practices are assumed, given student learning outcomes and experiences. In 1997, the curriculum was replaced with the current curriculum guide. This is insightful since the old curriculum, prior to 1997, was teacher centered. How to teach was the main focus of the guides, while learning outcomes were briefly outlined for grades three, six and nine. After 1997, the curriculum shifted to encompass a student centered approach and specific learning outcomes for all grades. Junior kindergarten to grade twelve are currently included in the new curriculum document (Anderson, et al., 2003). Westerman (2003) conducted a study looking at novice versus expert teaching practices, and found that the expert teachers were more successful in their teaching practice, and common among all was the heavy emphasis on student learning. Novice teachers displayed greater concern for their own teaching practice, oftentimes tightly following a lesson plan, with little attention to the student experience. Similarly, Trigwell et al. (2000) noted that as teachers develop expertise, their conception of teaching shifts from a concern of teaching practice to a concern of student learning. For instance, teachers with a teacher oriented concept of teaching may question how to teach the lesson, while teachers with a student centered concept of teaching may question what the students have experienced.

Thus, given the content from PS, teachers appear to value a student centered approach, demonstrating that the act of assessment is not as significant as student experiences and learning outcomes. This is what drives the content of teachers' assessments. Freire (as cited in Giroux, 2011) asserts that pedagogy must be seen as a process of individual and social transformation, rather than knowledge transmitted and

assessed. Students are to gain experiences and have the opportunity to learn from those experiences, as a process of transformation. One teacher in PS commented about her student learning demonstrative of Freire's (as cited in Giroux, 2011) concept of critical pedagogy:

> *At first they're shy and they hardly talk, but as the year goes on they're questioning and answering, and developing these multicultural friendships. It's really an amazing thing. (p. 58)*

With respect to assessment as a source to inform practice, the above teacher's observation of her students' progress can be considered a method of informal assessment; however, the process, and experiences are what is considered of relevance, and little is revealed about the teacher's assessment strategy throughout the social studies project.

In accordance with Freire's (as cited in Giroux, 2011) idea of individual and social transformation, the data in all documents consistently provided evidence that all assessment is, or ought to be, used to enhance student learning, including the evaluative assessments used in reporting student achievement to students and parents. In essence, if all assessment in elementary education is enacted to improve student learning, as demonstrated through a variety of statements in OHPEC, then conceptually, there is no end goal. In this regard, all learning is continuous and progressive and all assessment strategies are used to guide learning. This is also evident in the OHPEC's standards of achievement included in all curriculum documents, for all subjects and all grades. The achievement chart provides performance standards based on a body of evidence collected overtime. Standardized criteria allow teachers specifically to assess how students are

performing in accordance with specific objectives. The notion of having standardized criteria indicates an assumption that all students are capable of mastering all learning objectives (Davis, 1993). Bloom (as cited in Davis, 2013), suggests that "criterion based assessment strategies provides insightful information about individual student learning that can be used to set clear goals, and acceptable levels of mastery" (p. 124), in order to provide each student with differentiated progression toward individual learning goals, and thus get the "most of the students to master most of the material most of the time" (p. 124). Furthermore, Bloom (as cited in Davis, 1993) describes how differentiated instruction can be utilized efficiently when knowledge about individual learners is known. Bloom (as cited in Davis, 1993) highlights how teachers can utilize information gathered from standardization to differentiate instruction.

Additionally, one teacher described the process she undertakes prior to a new school year, which included consulting her students' OSRs "to develop strategies on how to work with those who have learning challenges or are painfully shy" (PS, Dec, 2012, p. 29). This is directly linked to Bloom's (as cited in Davis, 1993) mastery learning concept, as the OSRs include student report cards which are criterion referenced evaluations. Furthermore, the guide to the provincial report cards, grades 1-8, describe the intended purpose of a report card is to communicate student achievement in a detailed manner than will allow students to set goals for learning, and to help teachers plan instruction for individual students (OME, 1998).

The guide also suggests that communication of achievement should be continuous throughout the year, as do the data from PS and OHPEC. OHPEC mandates that teachers utilize assessment in order to help them determine students' strengths and weaknesses,

and adapt curriculum and instructional approaches to meet students' needs. Specific to improving instruction, OHPEC asserts that assessment is used to ascertain effectiveness of classroom practices, guide the development of assessment tasks and tools, and help teachers plan instruction for learning. As noted, the intended purpose of evaluating students for a report card is to communicate achievement; achievement of both subject specific knowledge and skills, as well as achievement of learning skills. Learning skills is in this respect, all encompassing, and exemplifies a holistic account of student learning and development. Teachers in PS also demonstrated a holistic concern for student achievement and often included emotional and social characteristics as a part of the assessment process that informed teaching practice.

One teacher explained "[b]y Grade 6, his parents say he had no friends, poor grades and a poor attitude toward school" (p. 55). This indicates that academic, emotional and social attributes are used to inform student progress. Another teacher describes how she fosters social, emotional and academic learning to inspire her students' full potential. Although social and emotional dimensions of student development may seem difficult to assess, the report card guide provides a detailed, but non-exhaustive list of indicators of learning skills that can be used to assess both social and emotional dimensions of student learning. Some of the indicators include: responds and is sensitive to the needs and welfare of others; seeks positive solutions to conflicts, establishes positive relationships with peers and adults (MET, 1998, p. 31). These indicators are examples of behaviours that teachers can look for as indicators of learning skills, which in fact are deeply rooted in social and emotional dimensions of student development.

The criteria for PMATE requires that teachers provide evidence of student achievement, but does not limit student achievement to test scores. As a matter of fact, out of the ten indicators of student achievement listed in PMATE, only two provide evidence of student achievement by way of examination or assessment. The other eight indicators include aspects of achievement of learning skills. This is a significant finding as it indicates a high regard for student learning over test scores which supports the data found in both PS, and OHPEC.

Student evaluations can promote or hinder higher learning, thus measuring teaching excellence through student evaluations may not be a reliable source to inform practice. In this aspect, Morehead and Shedd (1996) suggested alternative methods for evaluating teaching practices. They suggested peer-review of teaching effectiveness for the purpose of exploring and investigating methods for evaluating and improving teaching. They also suggested faculty exchange and review syllabi, to visit, or video tape classrooms, and interview students in each other's classes. PS does not describe any of these circumstances to a high degree, but I believe that further research should be conducted for more insight into this topic.

Practice and experience

Practice and experience inform teachers' classroom practices and appears to demonstrate a system of loosely based research. Loosely based because the methods, data, participants, or results were ambiguous, but were apparent nonetheless. For example one teacher hosted a series of smart board lesson plans offered to teachers as an instructional resource that were "tested with children in their classroom" (PS, Dec, 2012, p. 23). However, as previously discussed, the results, methods and exact context under

which the lessons were tested are unknown. Although we can infer some successful student learning outcome with respect to these tested lesson plans, we cannot know under which the success was reported. The dynamics of elementary education is widely known. Resources, values, and strategic initiatives all vary in accordance to the needs of the student population. Thus, what has been documented to work in one situation may not work in another. As mentioned previously, applied research often is context specific (Patton, 2002). This is not to assume that the lessons are not excellent instructional resources, or cannot be applied across contexts, but we also cannot assume that it is transferable across contexts since no information about the context under which the lessons were tested is known.

The PS magazine includes a section called *tech class.* One of the issues focused specifically on "how to enrich social studies curriculum for grade 2 and three students, especially those who are reluctant readers and writers" (PS, Dec, 2012, p.58). The teacher featured in this section discussed how she used information computer technology (ICT) such as skype, email and blogs. The teacher documented success, using both qualitative (student observations of engagement, attitude and learning behaviours) "kids that have the hardest time reading and writing really enjoy the blog", and quantitative, "I base my oral communication mark on that" (p. 58). In the tech class section in the Sept 2013 issue of PS, the teacher featured in the article was presented with the issue of how to "help grade 8 students make the challenging transition from elementary-level to highschool level math" (p. 61). The teacher described how his method used Ipads, a web whiteboard app (Educreations) and a social media app (Edmodo). The data utilized by the teacher to gauge the success of the method were both qualitative, again observations of student

engagement with lessons, and quantitative, as he "used to have trouble getting completed, (or even partially completed) assignments from them. Now he receives completed assignments on time, and the quality is higher than ever before". The teacher featured in this section also admits to gaining insight into his teaching methods through exploration of the ICT used. When the apps were not appropriate to an assignment that he had created for the students, he commented saying that "it kinda blew up in my face" (p. 61). The teachers featured in the tech class sections are not intentionally developing research projects, and as Kreber and Cranton (2002), and Trigwell (2000) would suggest, these learning moments are based on practice and experience. However, the documentation of all of these practices are framed as research questions, with methods, data and results that do influence both the teachers in the articles, as well as those who read the tech class section. Discovery of knowledge in these instances, appears more as discovery of knowledge for application, since both teachers gained the knowledge through their classroom practices and utilized the knowledge within the classroom.

In Boyer's (1990) concept of a scholar, one must demonstrate a capacity to do original research, which includes studying a serious problem and presenting results. McMillan and Schumacher (1993) define research as a systematic process of collecting and analyzing information for some purpose. In the tech class sections outlined above, this is not the case,however, the knowledge gained does add to the teachers' experienced based knowledge, and through the magazine adds to other teachers' knowledge through their professional reading. Furthermore, the loosely based research provides more evidence of elementary educators as scholars of application and integration since knowledge of student learning was applied in the following context and integrated with

discipline specific knowledge (social studies, ICT, writing, reading and math). As such, for these students' and within this context, what was required of the teacher, was the application of knowledge in order to meet student needs, or as Schön (1986) asserts action research.

Cross (2000) considers a scholar of teaching one who is "actively engaged in what they know" (p. 66), Shulman (2004), questioned the purpose of knowledge if it is not used where it is most necessary, and Kreber (2000), Trigwell et al. (2000) and Boyer (1990) all insist that to be considered a scholar, one must first display excellence. So in terms of excellence, and as evidence that supports Cross's (2000) concept of educational research, and Shulman's (1986) action research, these loosely based research endeavours are exemplars of excellence and expertise at the very least. Teaching excellence is not intended to be devalued, since teaching excellence is gained over time, with practice and experience (Boyer, 1990; Kreber and Cranton, 2000; Shulman, 2004; Trigwell et al., 2000). In other words, one cannot simply become an excellent teacher without the wisdom of practice (Shulamn, 2004).

Research Question #2: How do elementary teachers gain knowledge of pedagogy, curriculum and experience?

Evidence from PS, OHPEC, FPP and PMATE suggest that teachers gain knowledge from literature and professional reading, collaboration in and across disciplines, participation in research, and through experience. Boyer (1990) described a scholar as one who is continuously transforming and extending his or her own knowledge through research, synthesis practice and teaching. Trigwell (2000) in extending upon

Boyer's (1990) concept of scholarship, suggests that teachers gain knowledge through four avenues: formal research, collaborative inquiry, literature and practice and experience. PS, OHPEC and FPP provide evidence that teachers gain knowledge from literature, through dissemination of government policies and documents, professional reading, and online resources. They also gain knowledge from collaboration with educational programs, and professional memberships. From formal research through additional qualifications and graduate studies, and through practice and experience participating in research through board wide initiatives, province wide student evaluations, experts, guest speakers, and community organizations. Teachers also gain knowledge of teaching through reflective practice as exemplified through teachers' comments.

Literature: Government policies and documents

Data from PS and OHPEC indicate that teachers gain knowledge of curriculum, pedagogy and instruction from government sources. PS referred to Canada's Breakfast Report, NGO funded government initiative, Canada's Food Guide, Ministry of Educations School Food and Beverage Policy, and the Healthy Food for Healthy Schools Act and Canada's Accepting Schools Act. OHPEC referred to 27 government documents that could be traced back to traditional peer reviewed, published research (such as Nishida, Uauy, Kumanyika, & Shetty, 2004 and US Department of Health and Human Services, 2005). The government references included reports from expert panels, instructional resources, evaluative resources, frameworks and initiatives. Collectively the government references provided the premise to curricular, instructional and pedagogical

practices through evidence based research and provided instructional, pedagogical and curricular resources to support teachers in applying and integrating the knowledge in the context of their classrooms.

For example, Think Literacy Success (OME, 2003) is a "call to action framework for embedding high literacy standards and effective literacy practices across the curriculum, from Kindergarten to Grade 12. It reflects current research from Canada and abroad, supported by the extensive experience of educators across Ontario" (p.11). The document provides best practices with respect to developing literacy. The report does not provide prescribed lessons, but rather uses best practice suggestions to guide instructional practices. This insinuates a level of expertise, since teaching is not based on a repertoire, but rather on practices that are shown to be optimal in facilitating student success.

Literature: Professional reading

All PS issues have a *review* section where teachers review professional books to share with members of the college. There were nine book reviewed in this issue, of which six provided discipline specific instructional and pedagogical insight to develop teachers' pedagogical content knowledge. Rice (1992) asserts pedagogical content knowledge is essential for scholarship as it allows teachers to follow how students make meaning out of instruction and content. One book reviewed emphasized the integration of instruction, technology, learning styles and curriculum, while the last two provided a platform for deep discussion around curriculum content. PS also referred teachers to the Margaret Wilson library, the Library for the OCT, from which the books that were reviewed can be borrowed.

Literature: Online resources

It will come as no surprise that teachers gain knowledge from online reading like teacher blogs, websites, government and nongovernment websites all of which provide discipline and non-discipline specific resources for instruction and curriculum. For example, the Dairy Farmers of Canada provide "additional online resources and games" (PS, Dec, 2012, p. 25). Eat Well and Be Active offers "ready to use teacher presentations and resources" (PS, Dec, 2012, p. 25). Eatrightontario.ca provides collection of recipes that comply with Ministry of Education's school food and beverage policy.

PS also refers teachers to consult online instructional resources and tools such as skype.com, pbworks.com, epals.com, kidblog.com, and flatstanley.com which are available to support teacher instruction for integrating technology into the classroom. The resources do not necessarily teach teachers how to implement these tools, but afford teachers the opportunity to utilize them, which provides experience based knowledge based on teacher's application of ICT resources.

PS also referred teachers to OCT online standards resources. For example, resources such as, "Learning from experience: Supporting beginning teachers and mentors resource kit"; "Living the standards resource kit"; and "Standards in practice: Fostering professional inquiry resource kit", and a self-reflective professional learning tool, to name a few, all of which are available for teachers to access online. OCT proclaims that dozens of professional publications are available online. They are regarded as "valuable resources for your career, important news and membership-related

information, research documents and reports, brochures on investigations and hearing processes and information on professional development courses" (PS, Dec, 2012, p. 79).

Collaboration: Non-government organizations

Solution Tree Canada also offered two institutes informing both pedagogy and instruction. One of which was simplifying response to intervention (RTI) and the other was an assessment institute. The advertisement found in PS, states that RTI experts "can help you efficiently identify students who need proper intervention, to monitor students' progress, revise their program if needed, and return them to their regular program once interventions have worked" (PS, Dec, 2012, p. 59). The aim of the assessment institutes was to "drill down to best practices that define the core of assessment" (PS, Dec, 2012, p. 59), in order to foster transformative learning and share knowledge about how to create a system of assessment that is responsive to student's needs.

East York-Scarborough Reading Association organizes an annual reading for the love of it conference, where a number of literary experts, and educators assemble to enhance discipline specific knowledge.

Egale Canadian Human Rights Trust (ECHRT) which is Canada's only national lesbian, gay, bisexual and trans (LGBT) human rights organization, offers free professional development workshops for every school in Ontario in response to Canada's Accepting School Act (2012). ECHRT provides "hands on training to effectively address homophobia, biphobia and transphobia in your classrooms; [build] skills and confidence in creating LGBT and queer (LGBTQ) safer and accepting schools; and free resources to support classroom teaching and school wide initiatives for LGBTQ inclusion (PS, 2012,

p. 67). This initiative provides knowledge, practices and resources to enhance pedagogical, instructional and curricular knowledge.

Collaboration: Professional membership

Through professional membership teachers are provided with resources and supports to enhance their teaching practices. The OCT provides access to mentorship via the New Teacher Induction Program (NTIP) and provides information about Additional Qualification (AQ) courses. However, members of the OCT have access to the Margaret Wilson library, teacher mentor program, emails connecting members with upcoming events, such as charity golf tournaments, and e-newsletter that showcase excellence in pedagogy. For instance, an e-newsletter included a video of an award winning teacher, awarded for his demonstration of the OCT ethical standards of care, trust, respect and integrity (OCT E-newsletter, Dec 2012).

OCT also hosted professional collaborative opportunities such as the ethical leadership institute which used collective discourse in order to hash out ethical dilemmas in education; as well as hosted delegations from around the world to share best practices.

The PS magazine, published by OCT, provides teacher tips, articles highlighting award winning teacher practices as well as the dissemination of research that supports initiatives that enhance the quality of student learning. For example, Canada's Breakfast Report (2012) states that many students come to school hungry, which is having an impact on their learning. As a result, teachers are providing morning snacks.

PS also serves as a loosely based peer review system, through the letters to the editor section. The peer review provides a platform for reflection on practices that impact

or impart value on the education system. For example, PS featured an article that highlights a quote from a teacher in large font stating:

> *I see some colleagues get bogged down by budget cutbacks and constant changes. But, honestly, it's never bothered me. I'm used to the military where you can have your opinion, but in the end you just shut up and do you job.* (PS, 2012, p. 44)

In response to that quote, two teachers wrote a letter to the editor that were published in the next PS issue, March, 2013. One teacher wrote:

> *I would like to express my disappointment that the editors of the December 2012 issue of Professionally Speaking chose to devote the entirety of page 44 to highlight a quote that ended with the words, "you can have your opinion, but in the end you shut up and do your job." As an Ontario teacher, is it not my duty to foster critical thinking in my students? Should I not encourage students to develop well-thought-out and supported opinions on any matter that concerns them? Is it not my role to encourage them to voice those opinions and to respectfully, but fearlessly, debate them with others in a dialogue that explores issues deeply in a quest for mutual understanding? Or is it my role to simply tell them to "shut up" and do as they are told. Perhaps in a military setting this may be acceptable, but to express this idea so prominently in a magazine that claims to represent the teaching profession is shocking. (*PS, March, 2013, p. 15)

While another teacher wrote:

> *I was just glancing at the December issue of Professionally Speaking when I came to a page that I found quite shocking, rather confusing and disturbing — page 44. Please explain why the editor chose to print this full-page photo and quote. What is the intended message? My interpretation of this quote is most disturbing; I am hoping you can clarify my initial thoughts.* (PS, March, 2013, p. 15)

In seeking a response to the question in the March 2013 PS issue, *what is the intended message* I looked in the June 2013 issue but found no follow up to this question. If nothing else, the letters to the editor provide readers with a platform for reflection on a topic, and perhaps the skilled self-regulated learners will take from this some insight that may prove to enhance the quality of student learning.

Teachers in PS attributed insight about teaching to observing an award winning colleague's classroom activities to "watch, learn and share best practices" (PS, Dec 2012, p. 29). This teacher was selected by the Toronto District School Board [TDSB] as a model for "equity and inclusion for Culturally Relevant and Responsive Pedagogies (CRRP) for beginning teachers" (p. 29). Furthermore, OCT offers a resource kit called Learning from experience: Supporting beginning teachers and mentors resource kit.

Experience: Educational programs

Dairy Farmers of Canada provide free workshops for teachers, and provide resources that inform pedagogy and instruction that are an "integrative cross curriculum healthy living program" (p. 15). Curriculum Connections offers free lessons and resources on how to integrate insurance education into the curriculum. Canadian Produce Marketing Association (CPMA) offers curriculum for grades 1-6, to encourage children

to consume more fruits and vegetables. Dairy Farmers of Canada, in partnership with Osteoporosis Canada and the Speaking of food and Healthy Living Award: Excellence in Consumer Consumption offer Power4Bones, a "free web-based, cross curricular program that supports student development of food and physical activity skills that build strong bones for life" (PS, Dec, 2012, p. 56). Solution Tree Education Canada Inc. offers "on-site professional development (PD) driven by student achievement… an ongoing support system of seasoned and successful educators to keep you on track of your PD goals" (PS, Dec 2012, p. 11).

Teachers gain knowledge through educational programs such as Peace by PEACE, the Tribes project. The Tribes Project and Peace by PEACE were referred to as supplying "the tools to master invaluable skills students need to collaborate, negotiate, offer opinions and solve problems" (PS, Dec, 2012, p. 28). The programs demonstrate how practice informs educator of a societal issue that requires investigation for the purpose of resolution, which Boyer (1990) expresses is the underlying reason for scholarship. For example, the Tribes Project (2014) asserts that the project itself, is "*a true testament to the power and urgency of our youths' perspectives on race issues" (para. 12).* The Tribes project uses theatre to bring together diverse groups in order to empower understanding and respect. The Tribes members research, create and perform original productions that are specific to the group, and in doing so require engagement of teachers and students. Teachers' learning is reflected in this, teachers gain knowledge of pedagogy, curriculum, and instruction through this initiative as they are afforded the opportunity to reflect on the discussions, thoughts and feelings of those in the tribe.

Peace by PEACE supports the development of conflict resolution and critical thinking through active participation, and "debriefs", essentially providing students with opportunities for focused reflective discourse, which as Mezirow (1991) asserts in key to transformative learning. By fostering respect, empathy, care, and empowerment, Peace by PEACE is able to target sensitive issues, and provide life skills necessary for healthy conflict management. The program was developed for grade five students and runs for 11 weeks for ninety minutes a week. Peace by PEACE also connects directly with OHPEC curriculum guidelines for developing personal and interpersonal skills (Peace by PEACE, 2014). The program can enhance teachers' learning, as Habermas (as cited in Kreber and Cranton, 2002) asserts is an act of instrumental and communicative learning, which affords emancipatory learning, given the opportunity to reflect on the learning experiences.

Experience: Experts

A number of dieticians and a mathematics professor, were referred to and provided insight into curriculum, pedagogy or instruction. The dieticians provided information relevant to curriculum, and instruction to support implementation of healthy eating into the curriculum. The mathematics professor provided theoretical and practical knowledge that provided both premise to pedagogical and instructional teaching practices, and tips to foster engagement and love of math. He also referred readers to literature that will enhance students' understanding of complex mathematical concepts.

Research and theory: Additional qualification courses

In PS the OCT describes its members as "exceptionally qualified teacher practitioners with impressive academic credentials" (PS, Dec, 2012, p. 12), and that teachers practicing in Ontario have completed over 40 000 additional qualification (AQ) courses. PS also states that OCT works in collaboration with teacher education programs and AQ courses to ensure application of standards of practice. FPP highlight five interdependent domains of professional practice that describe the continuum of knowledge, skills and professional practices of teachers practicing in Ontario. Just as Trigwell et al. (2000) suggests about learning about teaching, FPP also insinuates that learning about teaching can be seen on a continuum, and is refined over time. While Trigwell et al. (2000) acknowledges that learning about teaching develops through research, literature, collaboration and practice, FPP (2010) requires that Ontario teachers remain committed to ongoing professional learning and asserts that "[p]rofessional practice and self-directed learning are informed by experience, research, collaboration and knowledge" (p. 13). FPP also provides a non-exhaustive list of professional learning opportunities, including participation in academic programs, such as AQ courses.

PS highlighted a number of AQ course options advertised from a multitude of higher learning institutes, including Queens University, University of Ontario, Redemeer University College, Brock University, and the University of Windsor; as well as the Ontario English Catholic Teachers Association (OECTA) and Elementary Teachers Federation of Ontario (EFTO). AQ courses include offerings specific to the discipline of teaching and learning, as well as discipline specific courses, providing evidence that teachers practicing in Ontario gain knowledge of pedagogy, curriculum and instruction

through AQ courses. For example, Queens University offers AQ courses for those who are interested in enhancing their knowledge about primary or junior education which is pedagogical since it emphasizes the attributes of learners at the primary/junior levels. They also offer courses for cooperative learning, which enhances instructional knowledge, and also offer a variety of discipline specific courses such as math, reading, history and so forth, which enhances knowledge of curriculum.

Through taking AQ courses teachers gain knowledge from literature, research, collaboration and practice, as FPP (2010) suggest is integral to developing excellence in teaching and Boyer (1990) and Trigwell et al. (2000) assert is essential for scholarship. In comparing the AQ courses offered, the University of Ontario requires teachers to recognize that teaching requires integration of content knowledge with pedagogy, which suggests teachers as scholars of application and integration. Queens University (2014) states on their website that "[o]utstanding instructors, research-based courses and an unparalleled level of personal support combine to…develop progressive, ethical and thoughtful educational leaders…" (para. 2-3). Thus, teachers are gaining knowledge from research-based activities, and collaborative learning opportunities afforded through the 'unparalleled level of personal support'.

EFTO offers courses that demonstrate a high value in social justice and equity, which provide premise to curriculum, instruction and pedagogy. Freire (as cited in Giroux, 2011) as learned through his years of practice, asserts that premise must always be key. In his efforts to teach adults literacy he learned that it is essential for them to first grasp why they need to learn this. Kreber and Cranton (2002) also highlight the importance of premise in all three dimensions of teaching. Teachers must first understand

why it is necessary to implement a specific instructional technique, why it is necessary to present specific curricular content, and why it is necessary to understand the learner's experience (which translates into pedagogical premise). Thus, AQ courses offered through the EFTO provide and value premise as the key to deep understanding.

Entwistle and Smith (2002) concludes through their research that deep learning occurs when individuals understand and value the content, and FPP asserts that teachers ought to have the freedom to enhance their knowledge in whichever discipline they hold a deep interest in. According to Entwistle and Smith (2002), teachers' beliefs about a topic impact student learning. If teachers value the topic, and understand its relevance to themselves, and their students, then they will expect that of their students and provide meaningful learning experiences that will foster a deep understanding. On the other hand, elementary teachers who are coerced into teaching a discipline that they have little value for, which is often the case in elementary school systems, their knowledge is surface, and the backlash of this is that students also demonstrate surface learning. Entwistle (2002) also asserts that in cases where teachers hold little value or knowledge of a topic, they often revert to transmitting knowledge, which is similar to Freire's (1996/1968) banking system, where teachers will attempt to deposit information into the students, which underlies a passive learning philosophy. Entwistle and Smith (2002) suggest that in cases where students are expected to produce the same information that was transferred to them such as facts, dates, and definitions, they cannot form deep understanding of a topic, since deep understanding requires self-awareness through dialogue, active participation and reflection.

As a college student I took a sociology course, and was awarded 100% in the course, proving that I had strategically been able to memorize the answers to the questions asked of me. This is what Entwistle and Smith (2002) calls strategic learning. Encouraging teachers to seek out and enhance knowledge in their discipline of interest promotes passionate, knowledgeable teachers who value the content, and encourage their students to value the content. It also provides the pedagogical, instructional and curricular knowledge necessary to support deep learning. Rice (1992) describes three attributes of a scholar that support Entwistle and Smith's (2002) theory of strategic versus deep learning, and how that can be developed through AQ courses that are catered to the interest of the teacher. Rice (1992) suggests that scholars have an exceptional ability to make discipline meaningful for learners, have a well-developed pedagogical content knowledge, are able to follow students meaning making of instruction and content. Through AQ courses teachers can discuss, read, research and apply their knowledge to the classroom, and reflect on all of these aspects to inform and enhance these attributes.

Teachers in PS suggest that when teachers are able to teach in their special area of interest they have a greater capacity to enhance deep learning in their students. One teacher expressed this by saying "…during rotary, we teach all of them [students] in our specialty areas. That's what we love to teach best and where we can be the most creative" (p. 54). Boyer (1990) credits the success of many great academics to the contribution of creative teachers, since creativity is essential for integrating knowledge of student learning, interests and abilities, with knowledge of content. This exemplifies Rice (1992) and Shulman's (2004) pedagogical content knowledge.

Research and Theory: Graduate studies

Boyer (1990) stated that graduate education is where professional attitudes and values are shaped. Three higher learning institutes advertised graduate programs. Queens University (2014) offers Masters and PhD programs in education on campus and online, utilizing the slogan '*fostering a community of inquiry' (p. 40).* University of British Columbia advertised an online Masters of Educational Technology program, utilizing the slogan '*a place of mind' (p. 64).* Royal Roads University (2014) offers a Master's program that is both online and on campus, utilizing the slogan *'make the theoretical realistic'* (p. 76).

In looking at the slogans for these higher learning institutes it is apparent that a high value for inquiry, reflection and reflective practice is valued. Boyer (1990) stated that the work of higher learning, at the core, is and must remain disciplined inquiry and critical thought" (p. 69). In his conception of scholarship of application, he suggests that theory and practice interact to renew each other, thus keeping the passion for teaching learning alive. Passion for a given discipline indicates a high value and as Entwistle and Smith 2002) provides evidence of, fosters deep learning for teachers, and as a result high expectations for students' deep learning. Friere (as cited in Hugh, 2008) on the other hand, suggests an opposing concept to the slogan 'make the theoretical realistic' as he suggests that higher learning ought to "proceed from actual to theoretical" (p. 16). However, in following up further with Royal Roads University's (2013) philosophy about higher learning about teaching, graduate programs are led by "faculty with real-world experience…[and] deliver relevant curriculum and experiences" (para. 1), suggesting the importance of experience as a basis for learning.

Life experience

Teachers featuring in PS articles indicate personal life experience as a driving force impacting pedagogical, instructional and curricular practices. Freire (as cited in Giroux, 2011) asserts that experience must become an object for analysis. The teacher featured in the tech class section of PS also demonstrates this when he admits that his lesson 'blew up in his face'.

A featured article in PS described four teachers whose experience in the Canadian armed forces had impacted their teaching practices. One teacher described how her experience in the Naval reserve has given her "stories that helped make learning more tangible for her students", stating that:

> *At the intermediate level, we're trying to get students to look at the bigger world. When I was teaching a science unit on energy and heating, a student asked, 'How are homes heated in Afghanistan?' That led to a discussion about bukharis, the metal wood-burning stoves most Afghans use to heat their homes.* (PS, Dec, 2012, p. 47)

Thus, this teacher incorporated real world experience in her classroom as curricular content, which contributed to a deep level of understanding. Freire (as cites in Giroux, 2011) also describes how students ought to be seen as the problem posers in the classrooms, engaging in cultural questioning, and providing the platform for which dialogue can lead to higher learning, as the excerpt above exemplifies.

Another teacher described how his experience in the army had given him insight into pedagogy. He stated that*, "*most of the time it's more about motivating people to do

a job and empower them to have good ideas. Working with students is very much like that too" (p. 47). For Freire (as cited in Giroux, 2011) teachers ought to promote in their students self-agency, how to govern themselves, rather than be governed. This teacher's army experience provided him with insight which has transformed his underlying philosophy of teaching. On a similar note, another teacher described how his pedagogy and instruction has been impacted by his experience in the army stating that his military leadership taught him that relationships are key to higher learning, and that the best way to get through to his students is to show them he cares. Essentially, he suggests that a humanistic philosophy is essential to providing the most impactful and meaningful learning in his classroom, an attribute that is valued by Boyer (1990), Freire (1996/1968), and Mezirow & Associates (2000).

Reflection

According to FPP teachers gain knowledge from reflection on literature, research, practice and collaboration. Although mention of reflection in PS, OHPEC and PMATE was scarce, reflection can be inferred on the basis that teachers' comments about their experiences insinuate a high degree of reflective practice, as one teacher asserts "[a]s a teacher, I'm reflective in my practice — I don't want others to have to go through that same feeling of isolation" (p. 29). Furthermore, FPP requires that teachers practicing in Ontario "strive to be current in their professional knowledge and recognize its relationship to practice. They understand and reflect on student development, learning theory, pedagogy, curriculum, ethics, educational research and related policies and legislation to inform professional judgment in practice" (p. 13). Trigwell et al. (2000) in

his research on developing as a teaching scholar in higher education, discovered that teachers' are likely to progress along the teaching continuum when utilizing focused reflection, such as asking "what do I need to know about X here, and how will I find out about it?" (p. 163).

Thus, the FPP (2010) supports Trigwell et al.'s (2000) research on developing scholarly teaching since it explicitly places value on reflection as integral to elementary teaching practice. Westerman (2003) and Trigwell et al.'s (2000) research explains how learning about teaching, and teaching practice develops over a continuum, where practice, experience and reflection all transform teaching practices. Trigwell et al.'s (2000) model explains, how reflection impacts how learning about teaching evolves over time. As teachers develop skill, they move towards focused reflection, for example, reflecting on what smart apps ought to be utilized for optimal student learning outcome. Focused reflections provide insight and forethought useful for instructional planning, and is often developed through reflection on action. This is in contrast to an unfocused reflection, as demonstrated in the comment where the teachers' stated "[I] blew that lesson". A teacher in PS provides a further example of an unfocused reflection that transformed her when she explains that "hands-on learning is vital to engage kids in science" (p. 54). This teacher came to this conclusion only after having experienced teaching science in her previous school, where text books formed the basis of her science lessons, and later having taught science in a specialized classroom.

Research Question #3: How have teachers contributed to the production and teaching of knowledge with respect to curriculum, instruction and pedagogy?

Evidence from PS, OHPEC, FPP and PMATE indicate that teachers contribute to the discipline through writing, professional membership, learning communities, professional collaboration, internet social media, teaching and participation in research.

Teachers write about curriculum, instruction and pedagogy

PS provides evidence that elementary teachers contribute to the discipline of elementary teaching and learning through writing, editing, and publishing books about teaching and learning. PS refers to several books in the reviews section that are authored by K-12 teachers. The authors had anywhere from ten to 35 years of K-12 education experience, and appear to have a well-developed pedagogical content knowledge gained through experience driven by a keen interest in a particular discipline. Topics ranged from assessment for learning, guided reading, math workstations, technology into the classroom, media literacy, and writing. Collectively, the teachers who had authored the books reviewed, had also written many other books and teaching resources, as well as publishing in the Journal of Media Literacy, and Florida English Journal. All books reviewed provided knowledge of premise to instructional, pedagogical and curricular knowledge, as well as curricular, pedagogical and instructional content, essentially, what is taught and how.

Teachers also wrote letters to the editor regarding topics introduced in the PS magazine. As previously discussed, teachers were able to use the letters to the editor section as a forum to invite and extend a conversation regarding a particular article published in PS. For instance, an article published in the March 2013 issue of PS, had been followed up by letters to the editor in both June and December 2013 issues.

Furthermore, an article called “Not always right” published in the September 2013 issue, had three responses in the following issue. Teachers felt inclined to express their gratitude for the article. One teacher expressed how the article had impacted her teaching. She stated:

> *I am sad to say that it took your article “Not Always Right” to open my eyes to the possibility that I’m not doing enough for these students. After reading the article I did some research on the internet and found firsthand accounts of the biases, both mental and physical that left handed people encounter. I will be sharing my findings at the upcoming staff meeting and looking into the possibility of getting tools that our left-handed students need to make their lives easier.* (PS, Sept 2013, p. 15)

The teacher continued her letter by relating the article back to how she can foster inclusion in her classroom and how teaching her students about accommodating for different learners can be a valuable lesson. Although, on the surface, this letter to the editor is simply expressing gratitude for the knowledge shared, it also serves to reinforce good teaching practices, and disseminates a value of inclusion and diversity in the classroom.

PS encourages teachers to send in a ‘teacher tip’ for the chance to win an Indigo (book store) gift card. OCT members also contributed to the publication and editing of multiple OCT resources such as: Exploring Leadership and Ethical Practice through Professional Inquiry, and Cases for Teacher Development: Preparing for the Classroom. Members of the OCT also sit on the OCT editorial board and are responsible for setting editorial and advertising policy for PS, and for approving the magazines content. PMATE

also requires teachers to contribute to the discipline of teaching and learning by writing articles or newsletters that contribute to the teaching profession.

Teachers engage in professional duties

OCT members are a part of the OME's expert panel, and a part of the OCT's editorial board, quality assurance committee, accreditation committee, and standards of practice in education committee.

OHPEC suggests that teachers not only consult a number of reports written by the OME expert panels, but also volunteer to serve part of an expert panel. The OME (2004) established a panel of experts including, "teachers, consultants, principals, researchers, and professors" (p. v), in order to provide evidence based resources that provide both premise to instructional, pedagogical and curricular practices, and a multitude of best practices to incorporate into everyday learning activities.

K-12 teachers also served on committees and boards through the OCT. Teachers who serve on the accreditation committee ensure "the quality of teacher education programs in Ontario through regular review and accreditation of these programs" (PS, Dec, 2012, p. 73). Members of the Standards of Practice and Education committee advise "college council on the development, implementation and review of the ethical and practice standards and the professional learning framework" (PS, Dec, 2012, p. 77). The quality assurance board "assess the college's progress in meeting its legislative objectives" (PS, Dec, 2012, p.77). Furthermore, the editorial board has a huge contribution to the discipline as it sets the advertising policies and reviews the magazine's content. Through professional duties, practicing teachers disseminate values through the

decisions that are made in both the committees and panels. Even committees such as the finance committee, have a huge impact on teaching practices as it establishes budget plans which ultimately place value on specific areas relevant to teaching and learning.

Teachers take part in learning communities

PS provides evidence that teachers are engaged in community collaborative learning activities such as board and school wide PD activities, mentoring and role modelling through the New Teacher Induction Program (NTIP). According to OHPEC, the principals' role is to ensure that teachers have opportunities for PD, and are a part of an ongoing learning community. School boards also offer PD opportunities and support for topics of interest to schools. For example the District School Board of Niagara (2014) offers support for aboriginal education, environmental education, ICT, and special education. Teachers contribute to the discipline by presenting PD workshops and support services across the board, but also through participating in the PD and support offered. It is the extension of the knowledge disseminated that keeps the profession alive. As Boyer (1990) says, scholars must stay up to date on developments in the field and remain 'professionally alive', which does not always mean doing research and publishing, but utilizing the information while gaining new insight as a result of the application of the knowledge.

Furthermore, teachers share learning throughout their school communities. In PS one teacher stated "…[the ethical leadership institute] was an invaluable experience that I will take back to my school to support the work of other teachers" (p. 57). Freire (as cited in Giroux, 2011) asserts that learning is only valuable if it is connected to the "reality that

confronts us" (p. 155). By sharing these learning experiences with others in the context of the school, teachers are contributing to the discipline by applying knowledge for specific contexts in order to enhance student learning, and in doing so enhancing the teachers' insight.

PS featured another teacher who is described as being a "champion in the classroom…who holds an open door policy for learning to be shared, and for colleagues, families and community members to become co-teachers and co-learners throughout the learning process" (p. 29). Freire (1996/1992) asserts that relationship is central to pedagogy, education can be utilized as a mode to intervene in the world, and to make visible the relationships of knowledge, authority and power. The teacher described in the above comment, demonstrates pedagogical practice that includes the community of learners. Essentially, students', parents', teachers' and administrators' roles are equally valued. The teacher is the learner as much as the student is the teacher.

Teachers engage in professional collaboration

PS indicated professional collaborative opportunities such as international delegations, province wide learning institutes, and national conferences as avenues for teachers to share knowledge of teaching and learning.

Over 200 OCT members took part in an ethical leadership institute, which one member described as "education at its best-coming together, participating in collaborative discussions that support and further our understanding of the ethical standards for the teaching profession" (p. 57). One member also stated that "ethical dialogue can be challenging. Continual reflection is key to the embodiment of our ethical standards" (p.

57). Essentially, the institute served as a project of individual and social transformation that has proven to impact teaching and learning for those 200 members (Freire, 1996/1968).

PS also referred to Solution Tree's institutes, where presenters are teachers sharing knowledge from years of experience. Solution Tree presenter biographies indicate a wide range of disciplines with deep roots in K-12 education, all with a passion for their discipline.

The East-York Scarborough Reading Association also advertised their annual conference, and the OCT expressed pride in its Conference Inspiring Public Confidence. Teachers are invited to present at both the Inspiring Public Confidence and Reading For The Love Of It conferences. Poali (as cited in East-York Scarborough Reading Association, 2013) stated that the conference provides a "distinct opportunity to hear from current researchers, literacy experts and classroom teachers" (p. 3), suggesting the value of knowledge gained from experience. Trigwell et al. (2000) suggests that as teachers move along the teaching continuum their audience for learning becomes larger. Essentially, teachers begin with a concern for their own learning, then students' learning, then with their peers and colleagues, and others in the discipline.

Moreover, Trigwell et al. (2000) indicated that as the audience becomes larger the greater the opportunity for peer review becomes. He suggests that communication is the medium for "scrutiny, debate and learning to take place" (p. 165); essentially affording the extension and refinement of knowledge in the discipline. Presenting and sharing knowledge through conferences affords teachers opportunities for collaborative discourse, and opportunities to gain deeper insight about teaching and learning.

Teachers share knowledge of teaching and learning through internet and social media

Teachers are no stranger to internet and social media technology for sharing teaching practices. PS referred to teacher blogs, twitter, web tutorials, and e-workshops as avenues to share knowledge about teaching and learning.

PS referred to a TDSB teacher who hosted a variety of online smartboard tutorials for teachers. PS also recommends that teachers follow OCT on twitter to see what is "trending in the education twitterverse" (p. 22). Teachers in PS expressed the value of blogging for teaching purposes, and a number of elementary teachers have a class blog, or website for sharing "information about what we [grade three students] are learning; to get newsletters & calendars; and to find links to fun, educational websites students can visit independently" (Mrs. White's Website, 2014, para. 1). In using social media as an outlet for sharing teaching and learning practices, it appears that the content and level of depth varies depending on the teacher. Some class websites provided links to assignment descriptions for students with a multitude of links and resources for student learning (Mrs. Mellikov-DeLong, 2014), while other websites described briefly the curriculum expectations, also providing links to resources helpful to students. What these teacher websites reveal, is not necessarily how the teachers have utilized the websites in order to share knowledge of teaching practice, but show examples of practices that can enhance student learning.

Furthermore, one teacher in PS partnered with a retired school teacher to create a math program for youth available on YouTube. The teacher also posted other videos to YouTube and uses YouTube as an outlet for sharing teaching practices.

Social media has a far reaching audience, and can provide an outlet for peer review as comments and inquiries can be posted on blogs, YouTube, twitter and other forms of social media. However, using social media as a way to share and disseminate knowledge compromises the rigour of traditional peer review. However, it is a mechanism for collaborative discourse with peers in the discipline. Trigwell et al. (2000) suggests the quality of the communication ought to be far reaching, but it also ought to be impactful and open to critical examination (Shulman, 2004). In posting information on social media sites teachers are able to share their knowledge and practices; however the impact, and quality of dissemination is unmeasurable. Also without the peer review, reflective discourse and collaboration the knowledge shared through social media may not necessarily be trustworthy.

Teachers teach

The EFTO advertises AQ courses that are "taught by teachers in the field", and as Aristotle expressed (as cited in Boyer, 1990) teaching is the highest form of learning. However, PS did not provide a significant amount of evidence of this, with the exception of the EFTO advertisement mentioned above. FPP suggested a variety of ways for teachers to contribute to the discipline such as participating in "teacher education AQ policy development reviews including writing teams, consultations and validation teams" (p. 25). Similarly to PS, this does not necessarily support teachers as AQ teachers but does indicate their involvement in AQ course development.

FPP and PMATE suggest that teachers contribute to the profession through mentoring and acting as a role model for new teachers or colleagues. PS magazine

referred to the *Learning from Experience: Supporting Beginning Teachers and Mentors Resource Kit* (Kitchen, Cherubini, Smith, Goldblatt, & Engemann, 2008), that provided research based qualitative evidence that mentorship contributes immensely to new teacher success. The mentorship program, presently supported by the OME and the OCT, was developed "to contribute to the scholarship of teaching through the collaborative dissemination of the results of the induction research project" (p. 3).

The new teachers believed that the most valuable and impactful aspect of the mentorship program was being able to reflect and discuss concerns with a mentor, and felt that the mentorship program fostered self-efficacy, collaboration and communication skills that evidently enhanced student learning. The qualitative data from teachers demonstrate how the mentorship program afforded deep and insightful learning about teaching as a result of the collaborative partnership. One teacher also demonstrated how one mentor contributed to his confidence by seeking input and advice, while others felt empowered by being a part of a community.

The mentors also expressed a high degree of deep and insightful learning as a result of participating in the mentor program. Mentors sought advice and shared learning with other mentors about helping beginning learners, and felt that being a mentor "allowed them to think reflectively in order to form an idea or opinion and to then re-examine it in light of other participants' views" (Kitchen et al., 2008, p. 6).

Teachers engage in research activities

Teachers in PS participated in research activities which FPP and OHPEC assert is part of professional practice. In this regard Cross's (2000) conception of research

certainly can apply to teachers classroom experiences, since they are implementing a learning program and seeking feedback about student learning, then adapting teaching practices to accommodate the learner's needs. This is educational research, to learn and use knowledge in the context that it will be of the most use.

Teachers also participate in research activities through opportunities with EQAO. In the PS magazine EQAO advertised for teachers to score grade nine and ten EQAO tests. Thus, teachers have opportunities to be involved in research through student preparation and implementation of the test, and through scoring. Teachers are also data collectors; they collect both qualitative and quantitative data that is used for basic and applied research. For example, Algoma's approach (PS, Dec, 2012) highlighted how qualitative and quantitative data was used to modify and inform program practices. OHPEC described how the achievement chart used for K-8 reporting and assessment is based on a large body of evidence collected over time. Collectively, elementary teachers have contributed to the body of knowledge that is utilized for basic research. This ultimately contributes too much of the K-8 curricular, pedagogical and instructional practices. However, Boyer (1990) asserts that all scholars must have the capacity to do rigorous basic research, which PS, OHPEC, FPP or PMATE does not support or provide evidence of. FPP does not require teachers to engage in discovery research, but rather provides suggestion of research activities that can contribute to teachers' professional knowledge. Examples of the research activities that FPP suggested teachers engage in included inquiry about teaching practice, participating in research activities, working collaboratively with others to contribute to the knowledge of teaching and learning and exploring and utilizing educational research.

Research Question #4: What teaching practices are enacted by elementary teachers?

PS, OHPEC, FPP, and PMATE suggested that teachers provide safe learning environments, seek to foster moral development and critical thinking skills, and utilize experiential, authentic, and hands-on teaching practices to create a climate for deep understanding. Teachers should also demonstrate differentiated and inclusive teaching practices, engage in reflective practice, and use assessment as a tool for learning. Teachers also need to foster a supportive social environment, and integrate content and skills across and within disciplines to enhance learning.

Practices to foster a safe learning environment, moral development and critical thinking

According to Kreber and Cranton (2000) teachers utilizing good pedagogical practices, understand how people learn and how to best facilitate learning. PS, OPHEC, FPP and PMATE provide evidence that elementary teachers' pedagogical practices emphasize safe learning environments that encourage moral development and critical thinking skills. These pedagogical practices appear foundational for developing deep learning in K-12 students, just as Boyer (1990), Entwistle and Smith (2002), Freire (as cited in Roberts, 2010) and Mezriow (1991) assert is essential for deep learning in adult learners.

OHPEC asserts that "students need to examine the opinions and values of others, detect bias, look for implied meaning, and use the information gathered to form a personal opinion or stance, or a personal plan of action with regard to making a difference" (p. 61). With respect to the social and political agendas that help create and

make the OHPEC curricula content to be taught, it appears that teachers' being mandated to teach and foster critical thinking skills have a loop hole. For example, in the growth and development section, OHPEC states:

> *Parents and guardians are the primary educators of their children. As children grow and develop relationships with family members and others, they learn about appropriate behaviours and values, as well as about sexuality. They are influenced by parents, friends, relatives, religious leaders, teachers, and neighbours, as well as by television, radio, videos, movies, books, advertisements, music, and newspapers. School-based programs add another important dimension to a child's ongoing learning about sexuality. -OHPEC*

Given the importance that sexual identity plays on the growth and development of K-8 learners, and supporting safe and accepting social learning environments, the expectation provided above is quite vague; providing virtually no expectations that teachers are to educate students about LGBQ orientations, for example. Moreover, this portion of the curriculum has not been revised in fourteen years. How can we be expected to teach and foster safe and accepting schools when students are not expected to learn or understand about diverse populations? Educators have recognized it, even though this topic lacks value and recognition in the curriculum. Canada's Accepting School Act (2012) provides support for teachers, and the mandated critical thinking loop hole also provides a way that teachers can support healthy growth and development for their students in a sensitive open manner.

Freire (1970) asserted that the act of thought has little meaning without action upon the world, thus OHPEC values students as contributing members and acknowledges the impact that the student brings to the world. OHPEC also suggested that pedagogy must be structured with care, so that learning opportunities and teacher questioning can encourage the development of inquiry skills in students. OHPEC referred to critical thinking skills as essential for student learning. They describe in great detail the premises of critical thinking in elementary education stating that students must develop critical thinking skills through literacy in order to "…solve problems and make decisions related to issues of fairness, equity, and social justice" (p. 57).

Freire (as cited in Roberts, 2010) indicated that teachers can foster human potential by encouraging critical dialogue, which in consequence deepens learning since students are learning to "understand what is being communicated, rather than learning to perform (Entwistle and Smith 2002; Mezirow, 1991). Furthermore, by including students in their own learning process enhances their social responsibility as contributing members of the learning environment. For example, in PS students who were placed in school programs that fostered student ownership and personal responsibility for learning flourished. As one teacher commented, "[t]he kids grow and change right before our eyes in this environment…they're thriving. They're learning at their own pace in a more grown up social environment" (PS, Dec, 2012, p. 55).

FPP indicated that teachers "promote and participate in the creation of collaborative, safe and supportive learning communities [as they] maintain and uphold the principles of the ethical standards [care, respect, trust, and integrity] in these learning communities" (p. 13). PS expressed pride in elementary teachers' capacity to keep

students mentally and physically safe. Freire (1970) and Mezirow and Associates (2000) assert that when students feel safe, and supported they can ask questions, seek answers, take risks, explore concepts, and practice skills. Essentially, safe classroom environments foster student potential. PS teachers demonstrated safe learning environments through encouraging humanitarian efforts, embracing social justice, and providing opportunities for students to develop emotional and cognitive wellness. Further, PS teachers value freedom, and democracy as essential to developing student potential. Mezirow and Associates (2000) explains that transformative learning experiences require the values of freedom, equity, tolerance, and social justice. In addition, FPP expressed how elementary teachers use the ethical standards of care, trust, respect, and integrity, to guide their professional practice.

The ethical standard of care asserts that teachers are compassionate and accepting, while taking an interest in developing students' potential. One teacher demonstrated her care for her students when stating, "I value that they are in my care," she says. "I am determined to provide a space where students feel safe and comfortable to be who they are and to be able to take risks to reach their full potential socially, emotionally and academically" (PS, Dec, 2012, p. 29).

Mezirow and Associates (2000) also stated that to foster higher learning students must be free from distortions of power and influence, with equal opportunities to engage in learning. Freire (1996/1992) expressed a similar concept in his problem posing education, suggesting that the student experiences must be the starting point for education, and that education must be tied to the lived experience. Thus, students are able to understand the subject relative to their own lived experience, and in doing so teach

others of the subject from a new perspective. Ultimately, all individuals in a class collectively impact the learning of the group.

Further, Freire (1996/1968) insisted that education ought to be a practice of freedom. While he expressed freedom from oppression is integral to adult educators, his problem posing education can also be applied to elementary education, where early learners also need freedom. For example, PS describes a boy who had been harassed and bullied for years in his school. The bullying had affected his intellectual, emotional, social and spiritual dimensions. In a reflection of his experience in his old school, the boy stated, "You don't feel safe…[y]ou're always worried and distracted, trying to fix things" (PS, Dec, 2012, p. 55). When the boy was removed from the oppressive environment, and provided with the freedom to speak of his experience in an open and safe environment, he began to flourish as the following comment demonstrates:

> *He's a star,' they said. My husband and I looked at each other, thinking, 'Is this our son?' I cried right there in the room," she says. "They caught him before it was too late. We know he's safe and learning and having fun at school with a good group of friends. They saved our son.* (PS, Dec, 2012, p. 55)

Teacher classroom practices that promote safe learning environments must have the support of the learners as well. Students were called upon to help cultivate and support safe learning environments. To encourage students' support, teachers in PS modelled respect for all, worked to develop trust among learners, and modelled fairness so that students will feel cared for, and respected, in return respect others. One teacher in PS cultivated respect toward one another by introducing a wide range of cultural

backgrounds utilizing her rich student diversity as a starting point. This teacher also utilized programs such as TRIBES and Peace by PEACE in order to foster student moral development and respect for diversity. Furthermore, she was also a role model for beginning teachers in developing culturally responsive and relevant pedagogy, which is a framework that supports the inclusion of student lived experiences as the platform for learning to occur. She cultivated a climate where students had a positive space to explore interests and develop their human potential. Culturally responsive pedagogy supports Freirian ideals in that it acknowledges hidden political agendas, and works to remove the barriers to full human potential by giving students the lead role in their own education, not as students but in partnership with teachers, peers, families and the greater world around them. Similar to Freire (1996/1968), Mezirow (1991) and Boyer (1990), teachers in PS demonstrate an urgent need to foster human potential and understand that this can be accomplished by fostering a healthy social, emotional and physical learning environment. An individual featured in a PS article reflected on his school experience stating that "my favourite teachers were the ones who really cared. The ones who stand out are the ones who understood and recognized that I didn't necessarily have the same experience as the other kids in the class and that all the other kids didn't have the same experiences as one another" (PS, Dec, 2012, p. 84).

Experiential, authentic, and hands-on practices to foster deep understanding

Evidence from PS suggested that teachers value an instructional style that promotes deep learning over surface learning and this value impacts how teachers present content. Further, teachers suggested that traditional paper and pencil activities are still

valuable if they are connected to a bigger picture, and an understanding of why they are taking part in a particular learning task. One teacher stated:

> *While we do not need the same emphasis on paper-and-pencil algorithms, students still need to do enough to gain an understanding of the underlying structure of arithmetic. They also need to realize that every computer algorithm has been programmed by somebody, and that the programmer had to make choices. They should always regard the output with due skepticism and have the mathematical sense to monitor what they see.* (PS, Dec, 2012, p. 20)

Evidence from PS and OHPEC suggests that elementary educators believe that curriculum ought to give way to deep understanding connected to a bigger picture that can be transferred to life outside of school. One teacher stated: "As we learn about citizenship, rights and responsibility, students begin to understand the importance of using resources and contacts within their community" (PS, Dec, 2012, p. 29). OHPEC described the focus of its healthy living strand, stating it "…is not merely on health knowledge but rather on higher-level thinking connected to the application of skills for healthy living" (PS, Dec, 2012, p. 33). It also suggested that the emphasis must be placed on fostering an understanding in our learners of why they must learn about healthy living and what they need to know in order to make healthy choices across the lifespan. Thus, curriculum must never be taught in isolation of its premise. Students must be encouraged to develop deep understanding explicitly so that the knowledge and skills are applicable to real life experiences.

Moreover, Entwistle (1991) asserted that the learning environment influences the ways in which students will develop learning habits. He also explained how insight develops through collaborative discussion, and authentic tasks that have relevance in students' lives. Freire (as cited in Giroux, 2011) expressed how learning must begin with student experience, proceeding from actual to theoretical. OHPEC supports deep learning as integral to elementary education stating that:

> *Students are given opportunities to learn by doing. Their experiences in the program can include participating kinesthetically in activities in a gymnasium, in open spaces in the school, and outdoors; working with various types of equipment; working in a variety of group contexts; and discussing topics that have deep personal relevance and meaning. Students have opportunities to learn through creative work, collaboration, and hands-on experiences. (p. 5)*

Teachers in PS consistently demonstrated practices that fostered deep learning by providing students the opportunity to connect the knowledge learned in schools to the greater picture of their realities. Authentic learning experiences, play, discipline specific hands on learning activities, are some examples that afforded students opportunities to take an active role in their learning.

Authentic activities included student mentoring, acting, writing and utilizing ICT for audio and video digital reporting. Games and puzzles, according to one teacher, "require mathematical thinking, such as Reversi (Othello), Hex, Sprouts and tic-tac-toe". He also stated that bridge develops skills required for math, "from the need to adhere to

fixed rules to the solution of problems by creative insight", and ought to be encouraged in order to inspire and cultivate a love of math (PS, Dec, 2012, p. 20).

Experiential learning included time outside the classroom. Examples included seeing a live symphony at Roy Thomson Hall, a trip to Ottawa to learn about Canada's history and political system, and performing plays for local seniors. As Freire (1996/1968) and Kreber and Cranton (2000) and Trigwell et al. (2000) insist, experience is essential for learning, however it does not automatically produce deep learning, as it is the reflection and discourse following the experience that impacts the learning. Thus, although these learning experiences were referred to, it does not specifically indicate higher learning, but affords opportunity for higher learning through discussion and reflection.

In PS students were afforded the opportunity for discipline specific hands on learning by having a fully equipped science lab, music studio, woodworking shop and computer lab; with subject specialists to teach in the classrooms. Teachers in PS also included real world experiences using ICT, like skype and kidblog; where students across the globe can learn and appreciate diverse lifestyles, cultures and values by sharing pictures and stories with their international friends. Another teacher suggested that students must be afforded the opportunity to connect with writing to their own reality, like blogging, texting, and emailing.

PMATE supports experiential, authentic and hands-on learning practices by requiring award recipients to provide evidence of creating a stimulating and innovative learning environment and utilizing hands-on strategies and problem-solving activities into daily teaching practices.

Differentiated and inclusive teaching practices

PS provided evidence that teachers utilize methods of instruction that allow for differentiated learning. For example PS referred to the use of guided reading, math workstations, small needs-based groupings, careful text selection, assessment-driven instruction, and responsive teaching, to name a few. Teachers in PS exemplified a high degree of learner centered instruction stating that teachers must tailor instruction to student learning needs, customize lessons to students' needs, interests and learning styles, provide optimal challenge, celebrate diversity in the classroom, while taking into account physical, cultural, and learning differences. Teachers in PS also emphasized differentiating pace of learning for individuals.

In order to differentiate learning teachers in PS demonstrated a number of practices to "get to know" their students. For example, one teacher explained how she contacts her students over the summer to let them know what they can expect, to get to know students likes and dislikes. She also reads her incoming students OSRs in order to anticipate individual learning needs.

Ultimately, teachers in PS support and are demonstrating values and instructional methods that are disseminated through OHPEC, as it states that:

> *[R]esearch has provided evidence of the benefits of experiential learning and constructivist teaching, which emphasize the role of the teacher as co-learner and facilitator, promote authentic experiential learning and learning through inquiry, provide engagement through student-initiated work, create a sense of community through teamwork and collaboration, and provide options to accommodate different learning*

> *styles and intelligences. A well-planned program should provide activities at individual students' level of readiness but should also push students towards their optimal level of challenge for learning, providing support through shared and guided practice and gradually withdrawing support as the student achieves greater levels of independence in learning. It is important to have a balanced program that provides for both direct instruction in content and skills and opportunities for students to use their knowledge and skills in structured as well as unstructured activities.* (p. 41)

Instructional resources used by teachers in PS support multiple learning styles, and provide evidence that elementary teachers share knowledge across the discipline. For example, PS referred to the use of visuals, charts and graphic organizers for visual learners, and the use of manipulatives for hands-on learning experiences. Teachers in PS reported the sharing of instructional resources stating that traditional material, ready to use lessons and teacher presentations are available on the internet. However, as Trigwell et al. (2000) and Kreber (2002) state, the expert or teaching scholar does not rely on repertoire, as is indicative of ready-made lessons and teacher presentations, even if the lessons are most effective. Thus, teaching experts, or scholars would ideally create the lessons dependent on the students in the class, or at least modify lessons to suit specific classroom context. Although the majority of elementary teachers may be doing this, more research must be conducted to know for sure, as this research project is exploratory and provides only a broad insight.

Furthermore, a teacher in PS stated that current schools are not built with science labs that can "accommodate curriculum demands of today", and so textbooks remain the focus of science lessons. This could indicate repertoire and passive learning tasks for students, but, not necessarily, as teachers may use the content of the text to create active,

authentic higher learning tasks, and utilize the textbook as a resource to support learning and understanding. Trigwell et al. (2000) stated that as teachers gain teaching experience the focus of their lessons become less teacher/content oriented and more student centered. I believe that teachers, who are exceptional, experts and scholars have the knowledge and skills to provide hands-on authentic learning without a full science laboratory. I have taught science as a novice teacher, and have always included hands on science activities. I have a number of hands on science resources on my bookshelf that demonstrate hands on lessons; also the internet is replete with resources for incorporating hands-on science activities with little resources.

Interestingly though, the comment about text based science lessons did not come from a novice teacher, but from a superintendent of education, with impressive credentials and experience in a classroom, which indicates that practices valued in PS, OHPEC, FPP, and PMATE may not necessarily be what the majority of teachers are practicing in schools. More research must be conducted looking at practices of elementary teachers across Ontario, and not merely the teachers who are featured in PS as exemplary teachers with excellent practices.

Boyer (1990) asserts that the hallmark of the scholarly teaching is creativity. Teachers as learners transform and extend knowledge by engaging with subject specific knowledge, facilitating class discussions, and questions and problems posed by students, which will lead to creative new insights. This in in contrast to the passive banking system of education reported by Freire (1996/1968) which he describes as hindering the development of full human potential. Thus, the need for creative teachers, teachers who

are resourceful and find ways to provide students with experiences that coincide with how they learn best.

PS indicated creativity as being central to excellent practice, as one teacher's style was described as "nothing less than creative" (p. 27). Teachers in PS also expressed their gratitude in being able to teach within their specialty area since that is where they can be the most creative. FPP supports the value of creative teaching practices by suggesting teachers provide evidence of an innovative and stimulating learning environment and of creatively integrating content across multiple disciplines. Boyer (1990) suggests that being well informed, or as Rice (1992) and Shulman (2004) express, having a well-developed pedagogical content knowledge, is a necessary component to creative insight for helping learners understand. This poses a particular question in regards to the discipline specific knowledge of an elementary teacher. If k-8 teachers are in fact scholars of elementary teaching and learning, then surely they are also scholars of application and integration, since they are applying knowledge of teaching and learning theory, integrating it with all other subjects, including literacy, math, physical education and science with a high degree of student success. On the other hand, if teachers are scholars in a given subject, Rice (1992) and Shulman (2004) might suggest that teachers will be better able to support learning in their specific discipline, but if assigned other subjects may not provide the optimal learning experience.

Furthermore, Entwistle and Smith (2002) explain how teachers' personal understanding and value of a given topic impacts the level of learning he or she expects of his or her students. Teachers who have well developed pedagogical content knowledge and a high value in a given discipline will expect deep learning from students, while

teachers who lack insight, experience and knowledge of a topic may expect more surface learning from their students since the teacher themselves only have a surface level of understanding of the subject. However, more research must be conducted to know if the fact that many elementary teachers are generalists produces surface learning over deep learning in students. In other words, does the level of complexity of the subject content impact whether a teacher can be a specialist in a broad range of topics, and have a well-developed pedagogical content knowledge for all.

Reflective Practice

Through featured articles, teachers in PS exemplified reflection in action and on action. PD opportunities, such as the OCT ethical leadership institute, AQ courses and graduate programs also provided opportunities for teachers to engage in reflective discourse, evidently, transforming learning about teaching and learning.

Comments about student behaviour, attitude and engagement provided evidence that teachers are reflective in their practice. For example one teacher expressed the value in reflection when she stated: "[e]thical dialogue can be challenging. Continual reflection is key to the embodiment of our ethical standards" (p. 57). While OHPEC suggests that teachers "reflect on the results of the learning opportunities they provide, and make adjustments to them as necessary to help every student achieve the curriculum expectations" (p. 11).

The OHPEC also indicates that student reflection is critical for developing higher order thinking skills, and for students to reach their full potential. OHPEC asserts that students need "numerous opportunities to practice, reflect, and learn experientially in a

safe environment" (p, 6), and states that mastering skills and concepts requires personal reflection, and through ongoing practice and reflection about their development, students deepen their appreciation and understanding of themselves and others. Students are also encouraged to "reflect on and evaluate the entire [learning] process, thinking about what went well, what could have been done differently, and what should be done next" (p. 21). As Boyer (1990) expressed, the capacity for scholarship, and higher level learning begins in the early years, thus, OHPEC supports this notion by placing a high value on developing student reflection. Furthermore, this indicates a higher level of cognitive processing, as students are involved in metacognitive thinking (Kitchener, as cited in Mezirow, 1991).

Assessment: A tool for learning

Assessment, broadly speaking, was not a significant theme in PS; however, books written by teachers, and reviewed by OCT members suggest that teachers' value assessment for learning purposes. One teacher and author suggested assessing students daily, gathering a range of data, using formative assessment often, and giving students continuous assessment with concrete suggestions for improvement. OHPEC states that: "[t]he primary purpose of assessment and evaluation is to improve student learning. Information gathered through assessment helps teachers to determine students' strengths and weaknesses in their achievement of the curriculum expectations in each subject in each grade" (p. 34). OHPEC also states that to improve learning teachers ought to differentiate assessment tasks for individual student needs. As constructivist learning theories inform us, all students come to us with a diverse range of experiences that have impacted prior knowledge and impact their current learning habits, including values that

may impact attitudes about the subject and motivation to engage with the content. Entwistle and Smith (2002) describe this as personal understanding. Personal understanding impacts how students interpret and approach assessment tasks so, differentiating assessment can assure that students' learning is progressive as it will be approached from the students' own level of understanding.

The OHPEC outlines the ways in which teachers can differentiate assessment through accommodation and modification. OHPEC suggests that teaches can accommodate students by changing assessment procedures that enable students to show their learning, such as giving additional time, or permitting oral over written responses to test questions. Students who are on an Individual Education Plan (IEP) can have the curricular expectations modified so that all students have an opportunity to be successful in each school year. The emphasis is placed on the students' progress, rather than the product.

Assessment tasks were referred to in a book that was reviewed in PS. The assessment included "…conferring notes, conversation calendars, annotated texts, double-entry diaries, students' surveys and responses, exit tickets, inner-voice sheets, writing samples and drafts, silent-reading response sheets, work folders, discussion records, and response journals" (p. 61). These examples indicate differentiated assessment and allow for reflection and deep learning.

In PS there were four vague accounts of assessment. An advertisement for an assessment institute by Solution Tree, an advertisement requesting scorers for grade nine and ten EQAO exams; and a facebook poll informing members of where the bulk of teachers do their marking. The fourth account exemplified an authentic assessment task

as students' oral communication marks were based on communication over skype with international friends.

FPP suggests that teachers use appropriate assessment pedagogy to meet individual learning needs, and PMATE states that teachers ought to use "superior in-class assessment. The ambiguities of assessment practices throughout PS, OHPEC, FPP and PMATE may indicate that "one size does not fit all — that no single assessment can convey everything a teacher needs to know about a student. Multiple assessments over time must be used to understand how students are progressing, what they need next and how to plan instruction to get them there" (p. 61).

I must note, however, that although my research has not provided much insight into the assessment practices teachers are engaged in, there is an abundance of books, resources and teaching guides available for teachers to improve assessment practices. Further, if I had analyzed a different PS magazine perhaps my findings about teachers directly discussing assessment practices may have been a lot different. More research must be conducted to fully explore this topic in light of this particular framework.

On the contrary, OHPEC discusses how to best evaluate students using the mandated achievement charts. Thus, to an extent, assessment cannot be truly differentiated, since the criteria for evaluation is fixed. They are essentially created to measure an outcome and compare it against a predetermined outcome, thus dictating when and to what degree, what is to be taught. In this regard, Brookfield (1986) asserts that forced participation may result in learners being mentally or physically disengaged.

Supportive social environment

Teachers demonstrated efforts to collaborate with parents or guardians, community members and organizations to provide a supportive social environment where messages students receive from school are reinforced at home and in the community.

Teachers in PS demonstrated a supportive social environment by inviting guest speakers to share knowledge with students, stating that having guest speakers keeps the inspiration flowing in the class. Furthermore, Entwistle and Smith (2002) provide evidence that teachers' personal understanding of a given topic will impact how they present it. Thus, a guest speaker who has a deep understanding and value in the topic he or she is presenting is more likely to impart a deep understanding in students.

One teacher located in an inner city Toronto school relied on parents to help build the cultural diversity of the class personalizing the learning community and creating a more meaningful learning environment. One teacher in PS also exclaimed that teachers ought to utilize "outside resources, bring guest speakers into the classroom and take your students into their community. The sooner they understand the importance of using resources and contacts within their community, the better off they'll be" (p. 29).

PS advertised NGOs that provided programs for students to attend outside of school, online or through school visits. Share the Music, a Toronto outreach program provided through Roy Thomson Hall and Massy Hall, offers live classical, jazz, blues or world music concerts and a pre-concert workshop. ActiveChefs, visits classrooms in order to provide students with kid-friendly recipes from around the globe to "teach healthy eating habits, develop basic cooking skills and encourage multicultural

awareness" (p. 25). Agriculture in the classrooms provide students with knowledge of where food comes from to foster environmental stewardship. Power4Bones is a web based program created in partnership with Dairy Farmers of Canada, Osteoporosis Canada and the Speaking of Food and Healthy Living award. The web based program is offered for grade five students and supports "student development of food and physical activity that build strong bones for life" (p. 56).

Teachers also exemplified practices to engage parents in their students' learning by using web-based media to showcase students work for parents to access at home and by being transparent with families about what students are learning about, and creating a plan for communication with parents regarding student learning. PMATE indicate that teachers are required to provide evidence of how they have involved parents and developed business and community partnerships, as these acts have been proven to enhance student learning (Healthy Schools, 2012). FPP describes teachers' effort to develop relationships with parents, guardians, colleagues, education partners, other professionals in efforts to remain committed to student learning, with the understanding that these relationships are integral for reinforcing a positive social learning environment.

Integration

Evidence from PS, OHPEC, and PMATE demonstrate a high degree of integration across curriculum with a particularly heavy emphasis of integration of ICT with all other areas of the curriculum.

PS includes a Tech Class section in all PS magazines, highlighting practices that integrate ICT with other curricular objectives. Books written and reviewed by teachers in PS also impart valuable advice for integrating technology into all areas of the curriculum.

A teacher, and author asserted that “no one needs to know everything about a piece of technology to be able to use it, and that the interactive whiteboard is no different from traditionally well-loved teacher tools such as the computer, blackboard, pens and erasers” (p. 65). Teachers in PS have also demonstrated their use of technology in the class by publishing youtube learning programs, using social media as a tool for learning in social studies; creating class websites, and affording students the opportunity to engage with ICT by creating their own blog sites as well.

PMATE requires teachers to provide evidence of creatively integrating subjects and ICT with, and across, other disciplines. OHPEC asserts that students should be encouraged to use ICT to support and communicate their learning whenever possible, and provides examples of how to incorporate ICT into the physical education curriculum. Some examples include accessing health, fitness, or safety information, using software to record food choices over a period of time, calculate nutrient intake, maintain a fitness profile, or monitor fitness targets.

Teachers in PS exemplified practices that demonstrated integration across disciplines. One teacher integrated literacy, social studies and ICT providing successful student learning, while another teacher integrated a movement activity with a reading activity in order to “tap into kids who are different learners” (p. 27).

OHPEC also provides premise to incorporating literacy and numeracy skills across the curriculum stating that all teachers are teachers of literacy, since communication is necessary for students to express and extend learning and experiences. OHPEC also provides an extensive list of how literacy can be integrated into the health and physical education, utilizing activities such as, “researching, discussing, listening,

viewing media, communicating with words and with the body, connecting illustrations and text, role playing to create meaning through stories" (p. 58).

Boyer (1990) asserts that integration is essential in order to give meaning to isolated facts. For instance, a student practicing a movement sequence in physical education will not understand the value of it, if it was not communicated through literacy. Integration across disciplines fosters higher learning because students are able to connect what they learn in one context to another. Furthermore, students who have the experience of integrated learning are better able to transfer skills across contexts, extending learning out of the classroom and into home and community.

CHAPTER FIVE: IMPLICATIONS AND CONCLUSION

Inductive analysis

The following section will conclude with insight based on the fifth research question, and the inductive analysis of latent and manifest content. Finally, I will conclude with some implications of my research and suggestions for follow up investigations.

Research Question #5: Do we have scholarly teaching in elementary education?

There is scholarly teaching in elementary education and teachers ought to be regarded as scholars. Strong evidence throughout all four documents suggests that K-8 teachers integrate knowledge of curriculum, instruction and pedagogy across all disciplines, with specific attention given to integration of ICT for enhanced learning opportunities and relevance for 21st century students. Furthermore, practices K-8 teachers utilized provided evidence that teachers ought to be regarded as scholars of application since practices demonstrated can be linked directly to research referred to, or disseminated through documents analyzed in this investigation.

PMATE outlines criteria that teachers must provide evidence of excellent teaching practices to be considered for an award. Five sections: innovative and exemplary teaching practices, digital literacy and information and communication technology (ICT), student skills development, student achievement and participation, and teacher commitment and leadership. In further analysis, the criteria present evidence that elementary teachers practice the scholarship of application, integration and dissemination,

innovative and exemplary teaching practices, and digital literacy, indicating a high degree of scholarship of integration and application.

Evidently, elementary teachers are scholars of integration. The criteria highlights that teachers must create stimulating learning environments, using hands on, problem based activities integrating ICT technology to improve student learning. In essence, teachers are integrating pedagogy, content knowledge, and instructional knowledge, with ICT, and knowledge of individual student needs. Boyer (1990) suggests that integration is necessary to bring meaning to isolated facts. In the context of elementary education the isolated facts represent discipline specific knowledge and skills that are integrated to improve learning bringing meaning to isolated disciplines.

Further, Boyer (1990) indicates that scholars of application use knowledge where it is most practical, and to resolve pressing issues. PMATE requires teachers to provide evidence that teachers are educating students on media awareness, cyber-bullying and safe and ethical internet use. PMATE also ask teachers to provide evidence that teachers help students in remote communities' access quality learning materials, and provide them with equal opportunity for success through the use of ICT. Essentially, the impact on negative messages in the media, and cyber bullying are profound issues on our society that require the application of knowledge of our scholars to tackle.

Humanitarian Efforts

Underlying all aspects of this research project is a common value in humanity, and the development of human potential. Essentially, educators in K-12 and higher learning institutes feel a sense of obligation for the betterment of humanity. The OCT's

FPP coincide with conceptions of scholarship and higher learning, indicating frameworks that value humanity, social justice, the environment and a moral obligation to act. Boyer (1990) questions how, given the global realities outside of schools, economies, starvation, disease, depleting energy supplies, pollution and so forth, can schools be a greater service to the nation and to the world than they are right now? While FPP states that members demonstrate moral action and "honour human dignity, emotional wellness and cognitive development…they model respect for spiritual and cultural values, social justice, confidentiality, freedom, democracy, and the environment (OCT, 2012, p.9).

It would seem, based on evidence from PS, OHPEC, FPP and PMATE that elementary teachers, are the service workers, those who apply the knowledge to sort out the "messy realities" (Shulman, 2004). The act of service, according to Boyer, (1990), Freire (1996/1968), Mezirow (1991), Schön (1986) and Shulman (2004), is the most crucial aspect of scholarship, since without it all the knowledge discovered, would serve no purpose. Further, Boyer (1990), Freire (1996/1968), Mezirow (1991), Schön (1986) and Shulman (2004) all agree that the purpose of knowledge attainment and application is to better humanity, to assist in the development of full human potential. Meanwhile the education act, which guides the regulation of the publicly funded school system, defines the purpose of publicly funded education as a means to provide a strong education system that encourages students who recognize and reach their full potential (Service Ontario, 01(1), 2012). Essentially, this value in the attainment of the human potential runs deeply through both higher, and K-12 learning institutes. Furthermore, it is through scholarly teaching that Boyer (1990), Schön (1986) and Shulman (2004) believe human potential can flourish.

Common themes, common languages

Boyer (1990) describes four attributes of a scholar: well developed ability to perform original research, current knowledge base, practice with honesty and integrity, and evidence of excellence in practice. FPP also, express that elementary teachers practice with honesty, and integrity in their commitment to student learning and state that teachers stay current in their profession, reflecting on student development, research, curriculum, pedagogy and experience. Boyer (1990) indicates that it is the interaction of theory and practice that inspires and renews teaching, which fuels creativity and new understandings. As Kreber and Cranton (2000) assert one of the hallmarks of an expert is the ability to self-regulate learning.

With respect to the scholarship of application, FPP state that members "apply professional knowledge and experience to promote student learning" (p. 13). With respect to the scholarship of integration FPP state that teachers "use appropriate pedagogy, assessment and evaluation, resources and technology in planning for and responding to the needs of individual students and learning communities" (p. 13). With respect to scholarly teaching, FPP state that members participate in the creation of collaborative, safe and supportive learning communities, that teachers may choose to present at conferences, workshops, or institutes, or contribute to professional publications. Noteworthy, however, is that these actions are not required, just as long as ongoing professional development is attained.

Trigwell et al. (2000) suggests that integral to scholarly teaching is the communication of discipline specific knowledge. Essentially, scholars of teaching want

not only to impact their own students' learning but also want to impact the entire discipline of teaching and learning so that all students in all communities, across the globe, can benefit. In this regard, the FPP does not support that this is necessarily expected or practiced. The FPP also does not expect teachers to participate in scholarship of discovery, in the traditional sense. Thus, FPP indicates that teachers uphold values congruent with scholarly teaching, and practice scholarship of application and integration.

FPP also suggest teachers ought to be self-regulating learners, which suggests a level of expertise in the discipline. Specific evidence for excellence in teaching is not apparent through this document, although it can be assumed given our understanding of how excellence in teaching is developed (reflection on experience and evidence based knowledge, in conjunction with dialogue). FPP clearly indicates that these are the attributes of elementary teachers. OHPEC asserts that teachers are to reflect on the results of learning opportunities to adjust instruction to meet student needs. Freire (as cited in Giroux, 2011) indicates that transformation of learning is a function of reflection, and more importantly, experience must become the object for analysis. He suggests that for transformation of learning, and development along the teaching continuum, teachers ought to "proceed from the actual to the theoretical" (as cited in Hugh, 2008, p. 2). Teachers must first be able to relate, and establish a base of knowledge relative to their own "form of truth", but it must be coupled with theory, self-reflection and critique to be meaningful.

PS and OHPEC as a means to disseminate knowledge of curriculum, pedagogy and instruction

OHPEC supports excellent teaching practices and student learning appears to be at the forefront. It also appears that OHPEC plays a large role in the dissemination of knowledge, providing premise for curriculum, instruction and pedagogy. Teachers are the scholars of application and integration, since they apply knowledge of the discipline of teaching and learning, as disseminated through the curriculum and integrate it across subjects. Consider the following example of a cycle of scholarship in elementary education from discovery of knowledge, to dissemination to application and integration.

A cycle of scholarship in elementary education

Data from PS and OHPEC indicate that teachers gain knowledge from government sources. PS referred to Canada's Breakfast Report, a non-government organization (NGO) funded government initiative, Canada's Food Guide, Ministry of Education's School Food and Beverage Policy, and the Healthy Food for Healthy Schools Act. Evidently, nutrition is heavily emphasized in this issue of PS, as the feature article is called 'food for thought,' and the cover page displays a large image of a submarine sandwich. When digging further into these government references, it is clear that the government sources referred to in PS and OHPEC are based in solid qualitative and quantitative research methods (for example see, Nishida, Uauy, Kumanyika, & Shetty, 2004; US Department of Health and Human Services, 2005, Canada's Breakfast Report, 2012). Thus, knowledge discovered by Nishida et al., (2004) and US Department of Health and Human Services (2005) was disseminated through reports and

recommendations, that resulted in changes made to Canada's Food Guide (Health Canada, 2011) and the amendment of the education act to "establish policies and guidelines with respect to nutritional standards for food and beverages and for any ingredient contained in food and beverages provided on school premises or in connection with a school-related activity." To further the dissemination, and application of this knowledge, the amendment to the education act also require that boards comply with the policies and guidelines established in the act (Service Ontario, 8(1) 29.3, 29.4, 2008). In compliance with the amendments made to the education act, the New School Food and Beverage Policy was announced in 2010 and implemented in 2011 (OME, 2013). The New Food and Beverage Policy is "part of a broader effort to develop healthier learning environments and improve student achievement since research has shown that children who eat a healthy diet are more ready to learn and more likely to be successful in school" (OME, 2013, para. 5).

Evidently, the OCT also disseminated and extended the knowledge through its featured article, Food for thought: How well do school-supplied lunches serve students brains, inquiring into the nutritional value of school served lunches across Ontario. Dieticians critiqued school served lunches to provide information about the nutritional impact the lunches (served on special days) had for helping or hindering learning. All lunches served were a healthy alternative when compared to the traditional 'pizza day' lunches, which indicates that schools have also been following through with government initiatives and policies that came to light as a result of research. Teachers, having gained the knowledge through reading, professional membership, conferences, experience, school initiatives and so forth, are the scholars of integration and application, since they

are in the front lines. For example, Nutella's Breakfast report (2012) as referred to in PS, provides a number of quotes from teachers describing the lived experiences of student who lack nutrition, and how that impacts learning. For example, one teacher states: "No breakfast, little chance to succeed in the classroom" (p. 4). While another states, "[w]hen children do not eat breakfast, they have to wait for recess to have a snack, as a result they are hungry and sluggish. Their mood does not pick up until they have food in their stomachs" (p. 4). What does this have to do with teaching practice and scholarship? Well, it appears that from knowledge discovered through rigours of research, to the experience based knowledge teachers are disseminating through their participation in research, human needs must be fulfilled for higher learning and human development to take place, just as Boyer (1990) Bruner (1996), Freire (1996/1968) and Mezirow (2000) all conclude. The very concept of pedagogy, instruction and curriculum are of little importance in cases where students lack focus, and negative attitude about learning (as observed by teachers in the breakfast report).

Evidence from the Breakfast report states that 77% of teachers have provided food for hungry students. This proves application of knowledge for certain, knowledge gained through experience, through policies and school initiatives; but also is evidence of ethical practice. Service working, the knowledge gained through all sources for the one act, of providing food for a student, is the absolute application of that knowledge at the grassroots level.

Another example of the cycle of scholarship in elementary education is demonstrated in knowledge of Canada's food guide. Freire (as cited in Giroux, 2011) asserts that education ought to be a mode of intervention in the world in problems like

poverty, exclusion and low moral and intellectual capacities, which are to be understood as larger public issues. Further across the cycle, the knowledge discovered in relation to Canada's Food Guide was disseminated through government reports and recommendations and was applied at the system level, to policies and legislations, such as the OME's School Food and Beverage Policy. School boards and schools also disseminate and apply knowledge through initiatives and funding that impact elementary educators practices on the front lines. The cycle is this: Research projects, conducted by both educators in K-12 and higher learning institutes provide the discovery; the reports, recommendations and policies, also created in partnership with K-12 and higher learning educators, provide the dissemination. While, K-12 teacher practices, exemplified in PS, indicate application and integration of knowledge for service.

To explain this further, Canada's food guide is based on the latest scientific evidence and lessons learned from implementing national intervention strategies…" (Nishida, Uauy, Kumanyika, & Shetty, 2004, p. 245) Furthermore, Canada's Breakfast Report (2012) interviewed 2000 Canadian parents to find out about children's breakfast habits, and how these habits impact student learning. Results show that more than 70 percent of parents did not know what a balanced breakfast was, and that 77 percent of teachers reported having given food to children who they thought were hungry. Teachers also noted that when children do not eat their "mood does not pick up until they eat" (Canada's Breakfast Report, 2012, p. 4). So what? As teachers, having witnessed and experienced the impact morning hunger can have on learning and thus, teaching practices, teachers are obligated to take action. The FPP asserts, the ethical standards behind teachers' professional conduct are care, respect, integrity, trust, and that

"[m]embers express their commitment to students' well-being and learning through positive influence, professional judgment and empathy in practice" (p. 13). In this circumstance, which according to the Breakfast Report (2012) occurs in seven out of ten classrooms, the teacher will empathize with students, having understood that poor learning behaviours may be a result of hunger. In being committed to student learning, 77 percent of teachers provided food for those students. Furthermore, FPP assert that moral action is embodied in the ethical standards. That being said, in obligation from the FPP, and the knowledge gained from the research conducted and disseminated by the OME, teachers are professionally obligated to find solutions to issues that impact their student population.

Ontario teachers are scholarly. Evidence found in all four documents indicates that teachers participate in application, integration, discovery and teaching of knowledge of pedagogy, instruction and curriculum. In the classrooms, teachers apply and integrate knowledge of instruction, pedagogy and curriculum, but also discover new knowledge of teaching and learning through practice and experience in applying knowledge. Elementary teachers also teach this knowledge within the school community, at conferences, in published works and online.

Throughout all four documents teachers' application and integration of knowledge was quite evident, while discovery and teaching was implied through referrals of teachers as conference presenters and as authors of websites, and books about teaching. Boyer (1990) suggested that scholarship ought to be more than the traditional research and publication. In Ontario elementary schools, as discovered through this investigation, it appears that application and integration are of a very high value. Perhaps this high value

is unique to Ontario since we are fortunate to be regulated by a professional body of educational experts. Other education systems may not be a part of a sustainable system, thus not be required to engage in activities such as taking AQ courses, sharing knowledge with colleagues via learning communities or professional conferences. I would be interested in investigating scholarship of elementary education across schools, boards, provinces, or countries in order to understand facilitators and barriers to scholarly teaching in elementary education. Moreover, if higher learning institutes still value the traditional research and publication or 'discovery and dissemination' over the service aspect, or the 'application and integration' than perhaps there is room for partnership, a trade off of values, skills and ideas about teaching and learning beginning from kindergarten all the way through to higher learning.

Elementary teachers must continue to be the excellent teachers that they are, and they must continue to apply and integrate knowledge on a deep level in order to develop the potential of the students they support. However, just as Boyer (1990) argues that research and publication do not complete what is meant by a scholar, the isolated acts of application and integration should not either. Boyer (1990) suggested that a scholar applies, integrates, discovers and disseminates knowledge of a given discipline. Elementary teachers are in an opportune position to act as scholars of discovery and dissemination, just as they do application and integration. Elementary teachers have access to participants such as colleagues, students, community members or parents/guardians, and can conduct research in an authentic classroom environment. Teachers can more easily collect qualitative and quantitative data and build a strong rapport with students, parents/guardians and other participants, which as Patton (2002)

notes is essential to authenticate the findings. Further, as evidence in PS, OHPEC, FPP and PMATE, teachers have a multitude of options for dissemination. Since the teacher is also the researcher, participant, data collector, analyzer and presenter of their own classroom formal or informal research, we can assume an authentic interpretation of the data. Barnett (as cited in Skelton, 2009) stated that teaching and research have become rivals, and insists that we need to foster a positive research-teaching relationship, in higher learning, why not in elementary learning also.

This research also has implications for providing a common language for educators in higher learning and elementary roles. Trigwell et al. (2000) stated that "communication is central to the idea of community and it is the medium for scrutiny, debate and learning to take place…[and that] improving teaching practice to improve student learning is based on reflective collaborative discourse" (p. 165). In this case, how can we communicate, scrutinize, debate, reflect and learn when we all speak a different language.

Perhaps teachers as scholars of application and integration have some wisdom to share specifically with regards to knowledge of application and knowledge of integration in elementary education. In the present research, creative teaching and reflection in and on action are the essential ingredients to applying and integrating curricular, pedagogical and instructional knowledge and skills with a multitude of disciplines, subjects and topics simultaneously.

When I envision how scholarship fits into the discipline of teaching and learning I see a Torus. A Torus that represents the ever evolving significant elements of the teaching and learning complex such as: the interrelationships between the internal and

external attributes of the learners, the internal and external attributes of the teachers, the physical, social, emotional environmental contexts, and the cultural, historical, political values, norms and expectations.

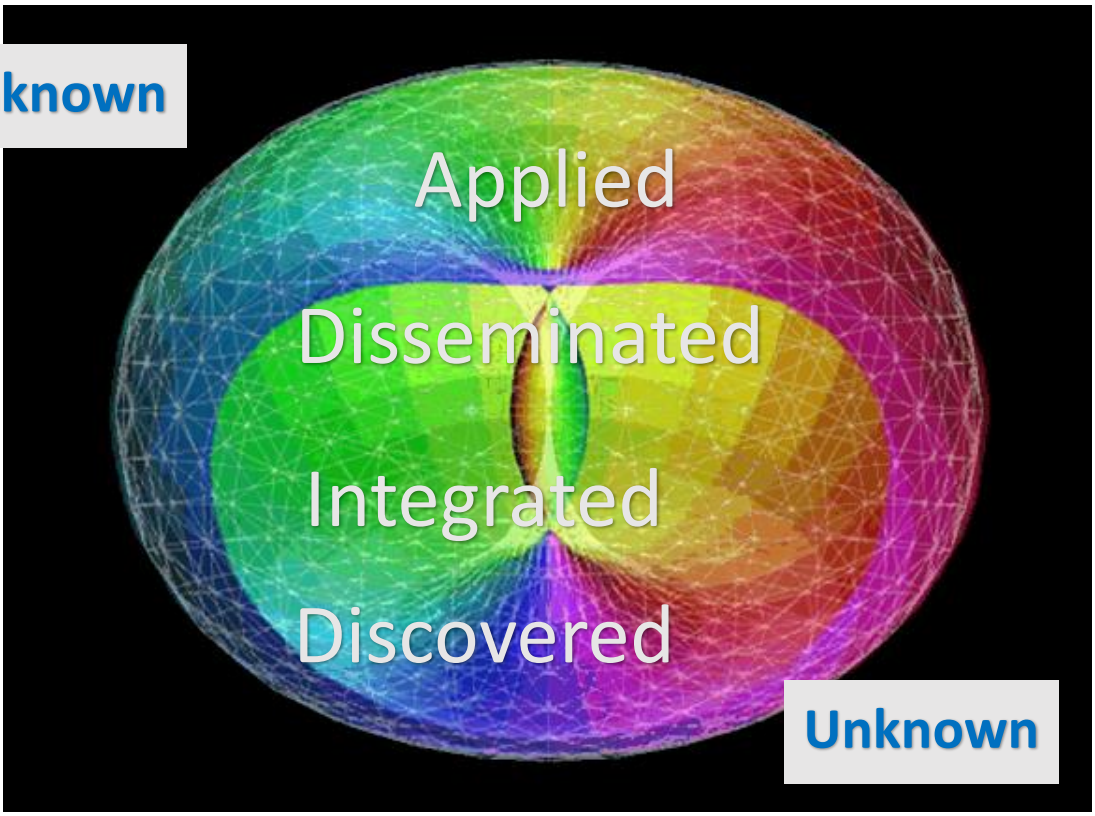

Figure 3: The Torus represents ever evolving elements of the teaching and learning complex such as: knowledge discovered, disseminated, integrated and applied with respect to curriculum, instruction and pedagogy, and how it impacts and is impacted by the interrelationships of the internal and external attributes of the learners, the internal and external attributes of the teachers, the physical, social, emotional environmental contexts, and the cultural, historical, political values, norms and expectations.

As a graduate student, I expect to encounter difficulty when seeking to do research in a school setting. Teachers are already positioned to be the researchers, to produce trustworthy, authentic and useful knowledge that can benefit their students, your students and all students. A scholar of history, researches history, writes history and

teaches history. Scholars of teaching and learning emphasize teaching students how to learn while using content as a means to do so. The hope is to inspire students who are self-regulating learners; as the old adage goes, give a man a fish and you feed him for a day. Teach a man to fish and you feed him for a lifetime (Ritchie, 1885).

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Appendix A

Sample: Professionally Speaking plain text in word document for analysis

Professionally Speaking, December 2012

Professionally speaking is published quarterly by the OCT to inform its members about the activities and decisions of the college. The magazine provides a forum for discussion of issues relevant to the future of teaching and learning, teachers' professional learning and standards of practice. The views expressed in the articles are those of the authors and do not necessarily represent the official position of the college. Reproduction, in whole or in part, of articles from this issue of professionally speaking is encouraged, please credit the OCT and professionally speaking, sept 2012. Letters to the editor and submissions on topics of interest to the profession are welcome. Unsolicited manuscripts cannot be returned. 6

Why do educators from around the world come to consult with the College? Simply, we are Canada's only regulatory body for teachers and have best practices to share. Want to learn more about the College's international visitors? Go to From the Chair. Guests at the College: The College was delighted to host three international delegations recently, including guests from Denmark, Afghanistan and Sweden. 8

Who are the College representatives?

Passing on practical Knowledge to the world: Delegations from all over the world come to the college to gather and share information on a wide range of education issues. - After decades of tumult and since the Taliban regime was toppled in 2001, the country is dealing with a supply of students that far exceed the pool of teachers — and most teachers only have the equivalent of a high school education or did not complete their postsecondary studies.

Afghan educators are looking at ways to rebuild and improve their education system. One of their objectives is to establish a system for certifying teachers and accrediting teacher training institutions.

And where do they turn to get the help they need? They reach out to countries like Canada, more specifically to the College, which is the country's only self-regulatory organization for teachers. We recently met with senior directors within the Teacher Education Directorate in Afghanistan who spent time at the College to learn our role in certifying teachers and accrediting teacher education programs.

Appendix B

Typology for Deductive Analysis

Scholarship of teaching: *Specific to teaching discovered knowledge about discipline of teaching-and learning to colleagues, peers others in the discipline- extending the knowledge about teaching and learning*

- Taking part in Professional learning communities (Formal and informal discourse and Dialogue)
- Conferences
- Written work
- Workshops
- Online forums (websites, etc)

Scholarship of teaching: *Specific to teaching curricular content to students* Pedagogy

- Physical, emotion, intellectual development considered Emotional development
- Consider whole aspect of child and learning environment (physical, environmental, social, genetic, home environment,
- Interested in students learning
- Finds ways to connect with students
- Learning styles
- Intelligences
- Cater to diverse learning needs
- Variety of teaching styles, methods, lessons, tasks,
- Authentic learning – problem based tasks
- Feedback often, formal and informal-
- Knowledge about how students learn and develop (opposed to knowledge about topic)
- Empathetic relationship with students in class
- Anticipate the support that students will require
- Demonstrate skills for a variety of learners (interests, learning needs, learning styles, intelligences)
- Experience teaching a subject, skill etc.
- Analogy's used to provide clarity
- A variety of verbal cues, analogies , explanations
- Excellent communication
- All tasks, lessons, etc should be connected back to subject taught
- Use of questioning to provoke thought and critical thinking (knowing when to use it)
- Being able to follow students learning throughout the process so can guide them back if necessary

- Knowing when to allow for exploration and when to be explicit

Instruction

- Opportunity for reflective discourse, critical thinking,
- Mix of individual, partner, small and large group activities
- Careful Planning
- Lessons, units, tasks are integrated across discipline and provide opportunity to connect big ideas, and transfer skills from one discipline to another
- Emphasize individual understanding
- Encourage alternative interpretations
- Provide purpose to lessons, tasks etc
- Lessons, activity are interesting and relative to student
- Evaluative tasks are open ended – allow for creativity, problem solving-deep learning-

Curriculum

- What curriculum is being taught (inductive)
- What is being valued (inductive)

Scholarship of application: *Application of knowledge for service*

- Programs that apply knowledge for service
    - Global education
    - Social equity
    - Healthy schools
    - DPA
- School boards / Schools strategic direction and initiatives (ex. Comprehensive schools)

Scholarship of application: *Application of knowledge about teaching and learning to enhance learning*

- 'Best practice'
- Literacy/ numeracy blocks
- Instruction
    - Opportunity for reflective discourse, critical thinking,
    - Mix of individual, partner, small and large group activities
    - Lessons, units, tasks are integrated across discipline and provide opportunity to connect big ideas, and transfer skills from one discipline to another
    - Emphasize individual understanding
    - Encourage alternative interpretations
    - Provide purpose to lessons, tasks etc
    - Lessons, activity are interesting and relative to student
    - Evaluative tasks are open ended – allow for creativity, problem solving-deep learning-
- Evaluation (Application of knowledge about higher learning)
    - Open assessment

    - Encourage reflective answers
    - Encourage individual interpretations of a topic
    - Formal and informal
    - Conferences after big evaluations
    - Learning prior knowledge
    - Problem based
    - Authentic
    - Innovative
    - Relative to students
- Interesting to students
- Continuous examination of program, lesson, unit etc.
- Curriculum
- Pedagogy
    - Knowledge about how students learn and develop (opposed to knowledge about topic)
    - Empathetic relationship with students in class
    - Anticipate the support that students will require
    - Demonstrate skills for a variety of learners (interests, learning needs, learning styles, intelligences)
    - Experience teaching a subject, skill etc.
    - Analogy's used to provide clarity
    - A variety of verbal cues, analogies , explanations
    - Excellent communication
    - Careful Planning
    - Continuous examination of program, lesson, unit etc.
    - All tasks, lessons, etc should be connected back to subject taught
    - Use of questioning to provoke thought and critical thinking (knowing when to use it)
    - Being able to follow students learning throughout the process so can guide them back if necessary
    - Knowing when to allow for exploration and when to be explicit

Scholarship of discovery: *Discovering throughout process of teaching and learning to enhance teaching and learning-for specific student body given the classroom- School - board-community context* (what is discovered in one context may not apply to the next)

- Reflection in action
- Reflection on action
- Evaluation
- Observation
- Marking
- Teaching notes
- Inquiry
- Investigating
- Exploring
- Research
- Experience "wisdom of practice"

- Teachers as learners

Scholarship of discovery: *In traditional sense*

- Research about teaching and learning
- Experimentation (in classroom or not)
- Test theory to practice
- Develop new theory

Scholarship of integration

- School, board strategic directions (e.g., Global education; Inclusive education)
- Integration of multiple methods of instruction
- Integration of instructional approached
- Integration of resources, tools, media
- Integration of knowledge: curricular content (skills, concepts)

Higher learning, Boyer (1990); Entwistle and Smith (2000); Friere (1996/1968) Kreber and Cranton (2002); Kreber (2000); Mezirow (2000); Trigwell et al. (2000) : *Teachers higher learning*

- Reflection and practice
- Dialogue and reflect and
- Teaching and reflect
- Research and reflect
- Practice and reflect
- Experience
- Opportunities for critical reflection
- Evaluation with specific feedback
- Variety of learning experiences
- Meaningful learning experiences
- Relevant, interesting
- Opportunities for Creative, problem solving
- Part of a community
- Collaborative with students, colleagues, community
- Empowerment
- Freedom
- Connect knowledge
- Imagination
- Democratic education
- Self-reflection
- Self- managed life
- Social action
- Engage in questioning
- Meaningful pedagogy- from experiences of learner so to relate themselves to what is being taught
- Learning limits imposed through cultures, politics etc.

- Analysis of experience as a starting point for learning
- Experience and theory used in conjunction-
- Experience reflected through theory-(in order to be a meaningful pedagogical resource-experience gives starting point from which to understand theory and how it applies to self)
- Theory as resource for learning
- Learning as means to intervene in the world (application)
- Critical thinking
- Challenge 'common sense' assumptions
- Understand and examine present through historical, political, social and cultural lens
- Encourage understanding of the relationship between knowledge, power and authority
- Give students opportunities to pose problems, have a voice
- Knowledge as a means to encourage agency
- Ethical responsibility
- Culture-how it shapes identity
- Teachers are students, students are teachers
- Process of learning emphasized

Excellent teaching practice, constrained by learning theory: *Teachers supporting higher learning in students Constructivist theory (Friere, Entwistle, Piaget, Vygotsky)*

- Knowledgeable about topic- well informed teaching
- Inspires inquiry
- Motivating
- Lesson built on prior knowledge
- Transform and extend knowledge
- Transform personal understanding
- Make use of Teachable moments
- Within the curriculum
- Implicitly through hidden curriculum, and what is not but demonstrated through social norms
- Values equity, freedom, reason
- Meaningful pedagogy- from experiences of learner so to relate themselves to what is being taught
- Learning limits imposed through cultures, politics etc.
- Analysis of experience as a starting point for learning
- Experience and theory used in conjunction-
- Experience reflected through theory-(in order to be a meaningful pedagogical resource-experience gives starting point from which to understand theory and how it applies to self)
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    - Encourage individual interpretations of a topic
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    - Conferences after big evaluations
    - Learning prior knowledge
    - Problem based
    - Authentic
    - Innovative
    - Relative to students
    - Interesting to students

Teachers teaching scholarship

- Teaching application (e.g. Me to we)
- Teaching discovery (inquiry)
- Teaching integration (to connect big ideas in and across disciplines, transferability of knowledge, concepts, skills across contexts)
- Teaching (peer tutors, reading buddies)

Appendix C

Sample of analysis research question #4: What teaching practices are enacted by elementary teachers?

Technology has not so much created new issues as sharpened existing ones. While we do not need the same emphasis on paper-and-pencil algorithms, students still need to do enough to gain an understanding of the underlying structure of arithmetic. They also need to realize that every computer algorithm has been programmed by somebody, and that the programmer had to make choices. They should always regard the output with due skepticism and have the mathematical sense to monitor what they see.

What mathematical lesson should every student master?

Pupils should be encouraged to play — looking for number patterns or constructing solid geometric figures. Many games and puzzles require mathematical thinking, such as Reversi (Othello), Hex, Sprouts and tic-tac-toe. I decry the loss of bridge among the young, as it develops many skills also required for math, from the need to adhere to fixed rules to the solution of problems by creative insight.

What is key to teaching math effectively?

Understanding that the student is not a blank slate. Both the teacher and the student come to the scene with their own view of what is being taught. The art of teaching is negotiating these differences so that students will progress.

Also, many teachers do not foster good mathematical hygiene. By this, I mean helping students arrive at a clear idea of what is being discussed, insisting on clear presentation of solutions, having students check their work and giving them the tools to know when something is going wrong.